

NOTES ON THE DISTRIBUTION AND TAXONOMY OF SOME
NORTH AMERICAN *CENTRIS*
(Hymenoptera: Anthophoridae)¹

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ABSTRACT: A key to the recognized subgenera is given. Characters by which females of the subgenera *Paracentris* and *Wagenknechtia* may be separated are discussed. Three new species of *Paracentris* (*C. ectypha*, *C. fisheri* and *C. harbisoni*) are described from Baja California, Mexico; the taxonomy and distribution of several North American species are discussed. A new species, *C. heithausi*, is described in subg. *Trachina* from Costa Rica. In the nominate subgenus the new species, *C. aethytera* from Costa Rica, and *C. erubescens* from Mexico, are described. Observations on taxonomy and distribution of other species are given. Within the newly described subgenus *Acritocentris* (type species: *C. ruthannae* Snelling), *C. agameta* is described from Mexico. Other new subgenera are: *Xerocentris* (type species: *C. californica* Timberlake) and *Exallocentris* (type species: *C. anomala* Snelling). Keys are provided for species in the subgenera *Xerocentris*, *Paracentris*, *Exallocentris* and *Acritocentris*. The following new synonymies are proposed: subg. *Trichocentris* = *Paracentris*; *C. marginata* = *morsei* = *caesalpiniae*; *C. birkmanii* = *subhyalina* = *lanosa*; *C. rhodoleuca* = *rhodopus*; *C. inermis gualanensis* = *inermis*.

INTRODUCTION

Since publication of my two earlier papers (1956, 1966), I have been able to study much additional material of this genus. With this added information I am now able to correct some errors in those papers and to clarify the status of a number of names. I take the opportunity also to describe a number of new taxa so that the names may be available to other researchers.

In an effort to emphasize group relationships within the North American species, I feel it expedient to propose several new subgenera and to slightly modify the characteristics of the subgenus *Paracentris*. The result is that two previously named subgenera, *Paracentris* and *Melanocentris*, from each of which extraneous elements are here removed, are now more homogeneous. A new key to the subgenera of *Centris* is presented below, based on that of Michener (1951), and reflecting the taxonomic rearrangements here proposed.

¹REVIEW COMMITTEE FOR THIS CONTRIBUTION

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Abbreviations used below in the keys and descriptions are explained in my earlier paper (Snelling, 1966)

KEY TO SUBGENERA OF *CENTRIS*

1. Maxillary palpus three-segmented; hind leg of male swollen, basitarsus usually with spine or elevated carina on posterior margin 2
 Maxillary palpus four or five-segmented; hind leg of male usually not swollen, basitarsus without spine on posterior margin 4
2. Male with large apical processes on eighth and ninth sternites; female without distinct secondary basitibial plate; clypeus without median yellow line 3
 Male eighth sternite with apical process greatly reduced, segment essentially a transverse band; female with secondary basitibial plate separated from primary plate by transverse line; both sexes with longitudinal yellow line on clypeus, sometimes incorporated into yellow of rest of clypeus *Trachina*
3. Male with second mandibular tooth larger than inner and closer to inner than apical; female with inner upper mandibular carina elevated basally and labrum variously modified *Heterocentris*
 Male with second mandibular tooth smaller than inner and closer to apical than inner; female with inner upper mandibular carina simple or elevated at apex, labrum simple *Hemisiella*
4. Females 5
 Males 13
5. Secondary basitibial plate with distinct overhanging margin 6
 Secondary basitibial plate without distinct overhanging margin 9
6. Maxillary palpus five-segmented; mandible quadridentate 7
 Maxillary palpus four-segmented; mandible tridentate (scutellum not bilobed) *Acritocentris*
7. Fore and mid basitarsi with an anterior row of short, flattened setae, fore basitarsus in addition with about four very long spatulate setae on posterior margin 8
 Fore and mid basitarsi without modified setae on either anterior or posterior margins (scutellum not bilobed) *Exallocentris*
8. Large forms, abdomen nonmetallic; scutellum usually bilobed; upper inner mandibular carina ending near base of next to innermost tooth; mandible subapically broadened *Melanocentris*
 Usually smaller forms, scutellum simple; abdomen usually at least faintly metallic; upper inner mandibular carina ending near base of innermost tooth; mandible slender subapically *Centris*, s. str.
9. Scutellum not bilobed, without bare areas; smaller species 10
 Scutellum bilobed and with well defined bare areas; very large species *Ptilotopus*
10. Mandible without tooth on under surface 11
 Mandible with distinct tooth on under surface near base of first apical tooth *Xanthemisia*
11. Fore basitarsus, on at least apical half, with anterior row of flattened setae and several elongate, apically spatulate setae on posterior margin of inner face; mid basitarsus with row of short, stout setae (except *C. cineraria* F. Sm.) 12
 Fore and mid basitarsi without setae which are differentiated from dense pubescence *Xerocentris*

12. Basitibial plate with secondary plate; pygidium with raised, triangular, secondary plate basally; clypeus usually maculate, rarely wholly black *Paracentris*
 Basitibial plate without secondary plate; pygidium without raised, basal secondary plate (with raised longitudinal area in *C. muralis* Burmeister); clypeus wholly black *Wagenknechtia*
13. Genitalia with giant branched setae arising from gonocoxite near base of gonostylus 14
 Genitalia without giant branched setae 17
14. Giant branched setae restricted to region near base of gonostylus; gonocoxite without apical projection; abdomen usually not metallic and without extensive maculae 15
 Giant branched setae scattered along inner margin of apical styliiform projection of gonocoxite; abdomen usually at least feebly metallic, often extensively maculate *Centris*, s. str.
15. Gonostylus not broadened on a vertical plane; maxillary palpus usually five-segmented 16
 Gonostylus much broadened in a vertical plane; maxillary palpus four-segmented *Xanthemisia*
16. Lateral ocellus separated from eye by less than its own diameter; terga I-IV with abundant fully erect pale pubescence on disc *Xerocentris*
 Lateral ocellus separated from eye by its own diameter or more; terga II-IV usually with sparse dark pubescence, pubescence rarely erect . . . *Paracentris*
17. Hypoepimeral area without tubercle; scutellum bilobed or not; maxillary palpus four or five-segmented 18
 Hypoepimeral area with tubercle; scutellum bilobed; maxillary palpus four-segmented *Ptilotopus*
18. Scutellum without lateral tubercles or swellings; upper inner mandibular carina ending near base of innermost tooth; abdomen at least feebly metallic (if not, terga with dense, erect pale pubescence) 19
 Scutellum with lateral tubercles or swellings; upper inner mandibular carina ending near base of next to innermost tooth; abdomen not metallic *Melanocentris*
19. Lateral ocellus separated from eye by about its own diameter; gonocoxite not apically drawn out, gonostylus elongate; clypeus usually maculate; maxillary palpus four or five-segmented 20
 Lateral ocellus separated from eye by more than its own diameter; gonocoxite apically drawn out and bearing at its tip the short gonostylus; clypeus immaculate; maxillary palpus five-segmented . . . *Wagenknechtia*
20. Maxillary palpus five-segmented; innermost mandibular tooth truncate; clypeus black or with a pair of pre-apical maculae *Exallocentris*
 Maxillary palpus four-segmented; innermost mandibular tooth acute; clypeus largely pale *Acritocentris*

***XEROCENTRIS*, new subgenus**

Diagnosis. Female: fore basitarsus without row of flattened setae on inner anterior margin or elongate spatulate setae on inner posterior margin; fore tarsal segments each with several coarse, flattened setae on each corner; mid basitarsus without row of flattened setae on inner anterior margin; pygidial plate not flattened on apical half, with median area longitudinally convex. Male: without exposed pygidial plate; gonocoxite without apical processes

but with giant branched setae basally; terga I-VI with dense pale discal pubescence; lateral ocellus separated from eye by less than an ocellar diameter.

Description. Mandible tri- or quadridentate, upper inner carina ending at base of innermost tooth, neither subapically broadened nor bent; maxillary palpus four or five-segmented, apical segment shorter than basal; ocelli anterior to narrowest part of vertex, lateral ocellus of male separated from eye margin by less than an ocellar diameter; first flagellar segment of male shorter than, equal to, or longer than scape or following three segments combined; mesonotum without defined bare areas; fore basitarsus of female without elongate spatulate setae or a row of coarse, flattened setae ventrally, but each tarsal segment with a few coarse, conspicuous, flattened setae on each apical angle; hind basitibial plate of female variable, but secondary plate not clearly delimited, either longitudinal or oblique; first recurrent vein entering second submarginal cell in basal third; discs of abdominal terga with abundant appressed or erect pubescence, often sufficiently dense to obscure surface; male without defined pygidial plate; pygidial plate of female distinctly elevated along midline, usually merely convex, sometimes subcarinate, never plane; male terminalia much as in *Paracentris*.

Type species. *Centris californica* Timberlake, 1940.

Included species. *C. hoffmanseggiae* Cockerell, 1897; *C. mixta* Friese, 1904; *C. pallida* Fox, 1899; *C. rhodomelas* Timberlake, 1940; *C. tiburonensis* Cockerell, 1923; *C. vanduzeei* Cockerell, 1923.

Etymology. Gr., *xeros*, dry, plus generic name *Centris*, in allusion to the arid and semiarid habitats of the included species.

This subgenus is proposed for the reception of several related aberrant species which had previously been placed in *Paracentris*. These species all agree in the structure of the female pygidium and in the lack of modified setae on the fore and mid basitarsi of the females and in the placement of the male ocelli. The males of all species of *Xerocentris* have abundant erect discal pubescence and the females have more discal pubescence than in species assigned to *Paracentris*.

All the species occur in arid or semiarid habitats. The group is North American with the exception of *C. mixta* which is found in arid regions of Chile and Peru.

KEY TO NORTH AMERICAN *XEROCENTRIS*

Females

1. Maxillary palpus four-segmented; abdominal terga with dense, appressed, pale pubescence obscuring surface; thoracic pubescence pale, fulvous tinged above; pygidium truncate, median ridge broad to apex 2
- Maxillary palpus five-segmented; abdominal terga usually with dark suberect to erect pubescence; if pale beyond second segment, pygidium is narrow at apex and median ridge is carinalike on apical one-fourth; pubescence often dark on lower half of mesopleura 3

2. Mandible tridentate; abdominal sterna II-IV with pale, pubescent fasciae on margins; clypeus often maculate *pallida* Fox
Mandible quadridentate; abdominal sterna II-IV without pale, pubescent fasciae; clypeus immaculate *tiburonensis* Cockerell
3. Scopa blackish; abdominal terga beyond second with long and short, simple, dark pubescence; pygidial apex broadly truncate, median ridge broad, evenly rounded 4
Scopa yellowish ferruginous; terga I-V with abundant pale, erect, plumose discal pubescence; pygidial apex narrowly truncate, median ridge carinalike toward apex *vanduzeei* Cockerell
4. Pubescence of upper half of mesopleuron pale, of mesoscutum tinged with fulvous; second tergum with at least some short pale pubescence on disc and along margin; terga finely, densely piligerously punctate 5
Pubescence of mesopleuron entirely dark brownish, of mesoscutum dark ferruginous; terga beyond first wholly dark pubescent; terga shiny, with sparse piligerous punctures *rhodomelas* Timberlake
5. Eye, viewed from side, wider than gena; clypeus distinctly bulging basally; pubescence of second tergum entirely pale; sterna III-V with pale apical fringes; vernal to early summer *hoffmanseggiae* Cockerell
Eye, viewed from side, no wider than gena; clypeus weakly bulging basally; at least some discal pubescence on second tergum dark; sterna III-V without pale fringes; late summer to autumnal *californica* Timberlake

Males

1. Maxillary palpus four-segmented; scape immaculate beneath and pubescence of terga entirely pale; clypeus pale 2
Maxillary palpus five-segmented; scape usually maculate, but if immaculate, some fuscous pubescence on terga IV-VI or clypeus wholly dark 3
2. Lateral ocellus separated from eye margin by slightly less than its diameter; basal sterna with some discal pubescence brownish; clypeus uniformly lightly tessellate, shiny *tiburonensis* Cockerell
Lateral ocellus separated from eye margin by half its diameter; sterna with brownish pubescence restricted to two apical segments; clypeus densely tessellate, slightly shiny, sometimes with shinier midline *pallida* Fox
3. Clypeus pale; margin of apical tergum truncate or convex; lateral ocellus separated from eye margin by one-half or more its diameter 4
Clypeus black; margin of apical tergum weakly emarginate in middle; lateral ocellus about one-fourth its diameter from eye margin *vanduzeei* Cockerell
4. Pubescence of legs, two apical terga and all sterna pale; apex of last tergum broadly rounded 5
Pubescence of legs, last two terga and most sterna largely or entirely brownish; apex of last tergum narrowly truncate; scape maculate *rhodomelas* Timberlake
5. TFD 1.35-1.38 x OCD; scape maculate beneath; terga IV-VI with pale pubescence only; late summer to autumnal *californica* Timberlake
TFD 1.49-1.53 x OCD; scape immaculate; terga IV-VI with some fuscous pubescence; vernal to early summer *hoffmanseggiae* Cockerell

Subgenus *PARACENTRIS* Cameron

Paracentris Cameron, 1903. Amer. Entomol. Soc., Trans. 29:235-236. Type species: *Paracentris fulvohirta* Cameron, 1903.

Pentthemisia Moure, 1950. Dusênia 1:390. Type species: *Centris chilensis* Spinola, 1851.

Centris subg. *Penthemisia*, Michener, 1951. Kans. Entomol. Soc., Jour. 24:3-4.

Centris subg. *Trichocentris* Snelling, 1956. Pan-Pacific Entomol. 32:4-5.

Type species: *Centris rhodoleuca* Cockerell, 1923. NEW SYNONYMY.

The subgenus *Trichocentris* was proposed for two species: *C. rhodoleuca* and *C. morsei* Cockerell. A third species, *C. vanduzeei* Cockerell was tentatively included. The first two species were known only from males and female characteristics were derived from *C. vanduzeei*. In 1966 I removed *C. morsei* to *Paracentris* and reaffirmed the distinctness of *Trichocentris*, largely on the unusual characteristics of *C. vanduzeei*.

More thorough consideration of the type species of *Trichocentris* has convinced me that this subgenus, as exemplified by *C. rhodoleuca*, should not be separated from *Paracentris*. Although superficially different in appearance, *C. (Paracentris) rhodopus* is a senior synonym of *C. rhodoleuca*. The second species of *Trichocentris*, *C. morsei*, is placed in synonymy with *C. (Paracentris) caesalpiniae*. On the other hand, *C. vanduzeei*, in both sexes, shares a number of characteristics with several unusual species here removed from *Paracentris*. These comprise the new subgenus *Xerocentris* described above.

Removal of these species results in a more uniform series of species in *Paracentris*. Contrary to the statements of Moure (1950) and Michener (1951) species of *Paracentris* do possess modified setae on the fore and mid basitarsi of the females. An additional characteristic of *Paracentris* females is the flat apical portion of the pygidial plate. The male characteristics of *Paracentris* remain as defined by Michener (1951).

Moure (1950) and Michener (1951) also are in error in their characterization of *Wagenknechtia*, for the females of this subgenus also possess modified setae on the fore and mid basitarsi of most included species. The usual row of short, flattened setae on the anterior inner margin of the fore basitarsus is present in *C. cineraria* F. Smith (apical half only), *C. muralis* Burmeister, *C. orellanai* (Ruiz) (apical half only) and *C. rhodophthalma* (Perez), the four described species of *Wagenknechtia*. In addition, each of these possesses on the inner posterior margin three or four elongate, apically spatulate setae, such as occur in *Paracentris*, *Centris*, s. str., and other subgenera. The mid basitarsi of *C. muralis* and *C. rhodophthalma* possess a compact row of short, broad, apically curved setae on the inner anterior margin as in *Paracentris*; this row is completely lacking in *C. cineraria*. In *C. orellanai* there is a row of stout flattened setae in this position, but these are separated by about their own width, are apically acuminate and are not curved. The structure of *Wagenknechtia* females is thus very similar to *Paracentris*.

The removal of several species, previously placed in *Paracentris* (as *Penthemisia*) by Michener (1951), to *Xerocentris* will now permit separation of females of *Paracentris* and *Wagenknechtia*. The basitibial plate of *Paracentris* females possesses a secondary plate. The secondary plate is situated at the base of the segment and is elevated above the level of the primary plate;

its anterior and lower margins are usually abruptly declivitous, although the anterior margin may slope less precipitously. The surface of the secondary plate is flattened in most species and there is usually an abundance of very short, fine appressed hairs. In the species of *Wagenknechtia* the basal portion of the basitibial plate is convex, usually polished and slopes gradually onto the lower, apical portion of the segment. A median depression may be present. In *C. muralis* the plate is elevated along the midline, with a small depression on either side.

The pygidial plate of *Paracentris* females always has a triangular, raised secondary plate basally; such a secondary plate is lacking in *Wagenknechtia*. The entire midlength of the pygidial plate is convexly raised in *C. muralis*, but in the other species of *Wagenknechtia* the pygidium is flat.

In *Wagenknechtia* species the hind tarsal claws are without a basal tooth, except *C. muralis*, in which a very low tooth is present. A sharp, distinct tooth is present on the hind tarsal claws of *Paracentris* species.

KEY TO NORTH AMERICAN *PARACENTRIS*

Females

1. Pubescence of head, thorax and legs entirely or predominantly black, that of mesopleuron entirely black 2
 Pubescence of head, thorax and legs entirely or predominantly pale, that of mesopleuron pale, at least in part. 6
2. Pubescence of thoracic dorsum entirely black 3
 Pubescence of thoracic dorsum pale, at least in part 5
3. First flagellar segment 3.5 x length of second (median impunctate area of clypeus extending about 2/3 of distance toward apex; TFD 1.87-2.02 x OCD) *laevibullata* Snelling
 First flagellar segment at least 5.0 x second 4
4. First flagellar segment 6.0 x second; TFD 1.12-1.23 x OCD; median impunctate line of clypeus extending toward apex as a very narrow, slightly raised line ending about 1/2 an ocellar diameter from apical margin *aterrima* F. Smith
 First flagellar segment 5.1-5.3 x second; TFD 2.26 x OCD; median impunctate line of clypeus broad over entire length *anthracina* Snelling
5. Large species, TL 14.5-18.5 mm; pubescence of vertex and pronotal lobes black; clypeal punctures sparse, obscure apicad, without distinct median impunctate line *mexicana* F. Smith
 Small species, TL 12.5-14.5 mm; pubescence of vertex and pronotal lobes whitish; clypeus with punctures sharply defined and with distinct, median, impunctate line, wider above *zacateca* Snelling
6. Clypeal integument entirely blackish 7
 Clypeal integument at least partially yellowish, orange or red 9
7. Clypeus coarsely, closely punctate, with narrow, median, impunctate line which may be obscured by roughened integument; facial quadrangle broader than long 8
 Clypeus sparsely, finely punctate, with broad, poorly defined median impunctate band; facial quadrangle longer than broad... *angustifrons* Snelling

8. Clypeus with median impunctate line obscured by roughened integument, line not raised; first recurrent vein entering second submarginal cell at basal one-third; punctures of scutum and scutellum less than a puncture diameter apart *harbisoni* new species
Clypeus with median impunctate line very narrow, distinctly raised; first recurrent vein entering second submarginal cell at middle; punctures of scutal center and of scutellum separated by more than a puncture diameter *lanosa* Cresson
9. Small species, TL 8.5-13.5 mm; clypeal punctures separated by less than twice a puncture diameter 10
Large species, TL 15.5-18.5 mm; clypeal punctures fine, separated by 2-4 times a puncture diameter *caesalpiniae* Cockerell
10. Inner orbits distinctly convergent above; TFD 1.71-1.74 x OCD; integument of legs fuscous, never red 11
Inner orbits parallel or slightly convergent above; TFD at least 1.9 x OCD; integument of legs either fuscous or ferruginous 12
11. Clypeal maculation pale yellow *cockerelli cockerelli* Fox
Clypeal maculation yellow-orange *cockerelli resoluta* Cockerell
12. TFD 1.90-1.95 x OCD; face black, clypeus with variable sized pale to bright yellowish macula; legs fuscous *atripes* Mocsary
TFD 2.0-2.1 x OCD; face blackish, clypeus, labrum and scape bright ferruginous; legs bright ferruginous *rhodopus* Cockerell

Males

1. Clypeus wholly black; pubescence of mesopleuron wholly blackish 2
Clypeus entirely or largely yellowish, whitish or orange-yellow; pubescence of mesopleuron variable 4
2. Pubescence of thoracic dorsum pale 3
Pubescence of thoracic dorsum blackish *aterrima* F. Smith
3. Pubescence of pronotal lobe, and usually entire lateral pronotal area, pale; first flagellar segment 2.6-3.1 x second *zacateca* Snelling
Pubescence of entire lateral pronotal area, including lobe, blackish; first flagellar segment 3.8-3.9 x second *mexicana* F. Smith
4. Pubescence of head and thorax at least partially pale 5
Pubescence of head and thorax blackish *anthracina* Snelling
5. Hind basitarsus much broadened toward apex, about twice longer than greatest width; hind femur swollen, about twice longer than wide 6
Hind basitarsus parallel-sided, elongate, at least 3.5 x longer than wide; hind femur usually about three times longer than wide, but may be swollen 7
6. Punctures of mesoscutum much sparser than those of scutellum; mesopleuron with scattered obscure fine punctures; clypeus orange-ferruginous *ectypha* new species
Punctures equally dense on mesoscutum and scutellum; mesopleuron closely, finely punctate; clypeus pale yellow *harbisoni* new species
7. Face narrow, inner orbits strongly convergent above; TFD no more than 1.72 x OCD; terga closely punctate 8
Face broad, inner orbits not or scarcely convergent above; TFD at least 1.8 x OCD, if less, then terga polished, virtually impunctate 9
8. Paraocular area and underside of scape (usually) yellow; clypeus coarsely, closely punctate, with narrow impunctate median line. *lanosa* Cresson
Paraocular area and underside of scape immaculate; clypeus sparsely punctate, with broad median impunctate area *cockerelli* Fox

9. Terga slightly shiny, with abundant coarse, simple black hairs arising from fine punctures separated by twice or less a puncture diameter; TFD at least $1.80 \times \text{OCD}$ 10
 Terga polished, with very sparse, inconspicuous black hairs arising from obscure punctures separated by more than three diameters; TFD $1.54-1.59 \times \text{OCD}$ (clypeus coarsely, closely punctate, interspaces dull, roughened) *fisheri* new species
10. Posterior femur and tibia black or darkly rufescent; pubescence of hind tibia at least partially black; terga thinly pubescent, without pale apical fasciae, pubescence largely or wholly dark 11
 Posterior femur and tibia ferruginous; pubescence of hind tibia wholly pale; terga either with thin apical fasciae of pale pubescence or with abundant, long, erect, pale discal pubescence *rhodopus* Cockerell
11. Clypeus polished, finely and very sparsely punctate; EL about $1.3 \times$ length of mandible; TFD $1.91-2.00 \times \text{OCD}$ *caesalpiniae* Cockerell
 Clypeus slightly to moderately shiny, coarsely and closely punctate, but often with more sparsely punctate median line, interspaces usually roughened; EL about $1.6 \times$ length of mandible; TFD $1.82-1.88 \times \text{OCD}$ *atripes* Mocsary

Centris (Paracentris) atripes Mocsary

Centris atripes Mocsary, 1899. Termész. Füzetek 22:254. ♂; Friese, 1900. Ann. K. K. Naturh. Hofm. Wein 15:296.

Centris atriventris Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:68. ♀ ♂. PRE-OCCUPIED.

Centris Foxi Friese, 1900. Acad. Nat. Sci. Phila., Proc. 51:350. New name for *C. atriventris* Fox.

Centris (Penthemisia) atripes, Snelling, 1956. Pan-Pacific Entomol. 32:7.

Centris (Paracentris) atripes, Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:20,21.

The type locality of *C. atripes* is "Praesidio, Mexico." This species appears to be common and widespread in Mexico; I have seen many specimens from the States of Sonora, Chihuahua, Nuevo León, Tamaulipas, Puebla, Guerrero, Oaxaca and Durango. A single male extends the range to COSTA RICA: Hacienda Comelco, elev 50 m, 24 km NW Cañas, Guanacaste Prov, 17 Nov 1971 (E. R. Heithaus, #13655; LACM), on *Hyptis* sp., 0730-0800 hrs.

A single male collected 2.5 mi SE La Huerta, 2200 ft. elev, Territorio Sur de Baja California, MEXICO, 8-9 Oct 1968 (E. L. Sleeper & F. J. Moore; LACM) is tentatively assigned to this species. It is similar to males from Arizona, but the mandibles are mostly yellow (black in all other males studied) and considerable pale pubescence is present on the fore and mid tibiae, usually entirely blackish pubescent in males of *C. atripes*. Although the genital structures are very similar to those of *C. atripes*, the shape of the gonostylus differs.

A similar male was taken in the foothills of the eastern slopes of the Sierra de los Cocopah, approximately 35 km S Mexicali, Baja California, MEXICO, 6 July 1953 (R. R. Snelling; LACM), on *Koeberlinia spinosa*. In this specimen pale pubescence on the legs is restricted to the fore femur and tibia and the clypeal punctures are distinctly separated with moderately shiny

interspaces. The clypeus of the La Huerta male is very closely punctate, the interspaces roughened and barely shiny.

These two males, if properly assigned to *C. atripes* are the first records of this species in Lower California. The male which I recorded (1956) from Brawley, Imperial Co., California, is a typical specimen of *C. atripes*. More material from Lower California is necessary in order to establish the identity of the population there.

Centris (Paracentris) caesalpiniae Cockerell

Centris caesalpiniae Cockerell, 1897. Ann. Mag. Nat. Hist. (6) 19:394. ♀ ♂.

Centris morsei Cockerell, 1897. Acad. Nat. Sci. Phila., Proc. 49:355. ♂. NEW SYNONYMY.

Centris marginata Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:67. ♂. NEW SYNONYMY.

Centris (Trichocentris) morsei, Snelling, 1956. Pan-Pacific Entomol. 32:4.

Centris (Paracentris) morsei, Snelling, 1966. L. A. Co. Mus., Contrib. Sci., 112:2.

This species ranges from western Texas to southeastern Arizona and adjacent areas of northern Mexico. *Centris morsei*, and its long-standing synonym *C. marginata*, occupies the same area and is usually taken along with collections of typical *C. caesalpiniae*. Although superficially very different in appearance from typical males of *C. caesalpiniae*, it is now evident that *C. morsei*, known only from males, is not to be separated. In morphological characters the two forms are inseparable; the apparent differences are now known to be the result of allometry, disappearing with large series available.

The primary morphological features separating these two supposed species have been the larger overall size, proportionately broader head and thicker hind femur of *C. morsei*. Measurements of long series of specimens demonstrate that all these characters form continuous clines. The dramatic differences in color between the largest specimens (*C. morsei*) and more typical *C. caesalpiniae* males intergrade to the extent that the above synonymy is unavoidable.

Centris (Paracentris) cockerelli cockerelli Fox

Centris Hoffmanseggiae Cockerell, 1897. Ann. Mag. Nat. Hist. (6) 19:395. ♀ (not ♂).

Centris lanosa, Cockerell, 1897. Ann. Mag. Nat. Hist. (6) 19:397. ♂ (not ♀); Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:69. ♂ (in part); Cockerell, 1906. Amer. Entomol. Soc., Trans. 32:97 (in part); Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:556 (in part); Timberlake, 1940. Pan-Pacific Entomol. 16:138 (in part); Snelling, 1956. Pan-Pacific Entomol. 32:7 (in part).

Centris Cockerelli Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:68. ♀.

Centris cockerelli, Cockerell, 1906. Amer. Entomol. Soc., Trans. 32:97 (in part); Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:552 (in part); Timberlake, 1940. Pan-Pacific Entomol. 16:138 (in part).

Centris lanosa lanosa, Michener, 1951, In Muesebeck, Krombein and Townes, U. S. D. A. Monogr. 2:1241 (in part); Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:6 (in part).

This is the form most often referred to as *C. lanosa*, but that species is known to be very different (see discussion under *C. lanosa*). The nominate form is found in Texas, New Mexico, Tamaulipas, Nuevo Leon and Chihuahua. In New Mexico and Chihuahua it intergrades with the following subspecies. Females of *C. cockerelli cockerelli* possess a pale yellowish clypeal maculation, ferruginous in *C. cockerelli resoluta*; the males of the two forms are inseparable.

Centris (Paracentris) cockerelli resoluta Cockerell

Centris lanosa, Fox, 1893. Calif. Acad. Sci., Proc. (2)4:22 (misident.).

Centris cockerelli, Cockerell, 1904. So. Calif. Acad. Sci., Bull. 3:160 (misident.); Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:552 (in part); Timberlake, 1940. Pan-Pacific Entomol. 16:138 (in part).

Centris cockerelli resoluta Cockerell, 1923. Calif. Acad. Sci., Proc. (4)12:76-77. ♀ ♂.

Centris lanosa resoluta, Michener, 1951. In Muesebeck, et al., U. S. D. A. Monogr. 2:1241.

Centris lanosa, Snelling, 1956. Pan-Pacific Entomol. 32:7 (in part).

Centris (Paracentris) lanosa resoluta, Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:6.

Distribution. Arizona, Nevada, California, Sonora, Baja California and Territorio Sur de Baja California.

***Centris (Paracentris) ectypa*, new species**
Figures 1-4

Diagnosis. Male: Labrum and clypeus yellowish ferruginous; hind femur swollen, about 1.75 x longer than wide; hind basitarsus more than half as wide as long, apical margin deeply emarginate; mesopleura nearly impunctate. Female: unknown.

Description. MALE (holotype). *Measurements.* HW 4.65; EL 3.25; UFW 1.90; LFW 2.30; TFD 2.05; SL 2.90; WL 12; TL 16 mm.

Head. Mandible slender, tridentate, inner tooth triangular. Clypeus moderately broad, CW 1.53 x CL; in profile, strongly bulging and convex, more sharply sloping basad; shiny, with scattered coarse and fine punctures, without defined median impunctate line. Face broad, inner orbits slightly convergent above, UFW 0.83 x LFW; TFD 0.63 x EL; TFD 1.64 x OCD. Scape elongate, about 2.3 longer than wide, SL 1.14 x 1F; 1F:2F:3F:4F = 51:13:19:20. OD:OOD:IOD = 8:6:13.

Thorax. Mesoscutum, between parapsides, finely punctate and shiny, interspaces twice or more a puncture diameter; scutellar punctures equal to scutal, separated by a diameter or less. Mesopleura shiny, very sparsely punctate. Propodeum shiny, sparsely and finely punctate. First recurrent entering second submarginal at basal third. Hind femur swollen, about 1.75 x longer than wide. Hind basitarsus (fig. 1) triangular, about 1.75 x longer than wide, apex deeply emarginate.

Abdomen. Terga shiny, finely, closely piligerously punctate; margin of apical segment convex; apical process of eighth sternum about 1.3 x longer than wide, apex truncate (fig. 3); process of ninth sternum about 1.75 x longer than wide, broadest subbasally (fig. 4).

Color. Black. Labrum, clypeus and transverse supraclypeal bar dull orange-ferruginous. Mandibles and legs brownish ferruginous, apical tarsal segments lighter. Pubescence pale ochreous; brownish on underside of thorax, on legs and on abdomen beyond first segment. Wings transparent, slightly brownish, veins and stigma brown.

FEMALE. Unknown.

Type material. Holotype male: Bahía San Francisquito, Baja California, MEXICO, 3 April 1947 (C. F. Harbison). Paratype male: 7 mi W Bahía San Francisquito, Baja California, MEXICO, 14 April 1947 (C. F. Harbison). Type material in LACM.

Etymology. Gr., *ektyphos*, puffed up or swollen, because of the enlarged hind femora.

Distribution. Known only from the area cited above.

Discussion. Both specimens, especially the paratype, are badly rubbed and some characters of the pubescence are uncertain. In general, the bee looks superficially like an unusually robust specimen of *C. cockerelli resoluta*. It differs from this and other known *Paracentris* by the very sparse, fine mesopleural punctation, the swollen hind femur and short, broad hind basitarsus.

This could possibly be the previously unknown male of *C. angustifrons* Snelling, described and known only from a single female from the Huachuca Mts, Arizona, but the thoracic punctation is quite different. Since the two sexes of *Paracentris* tend to be similar in thoracic punctation, I do not think it likely the two are conspecific.

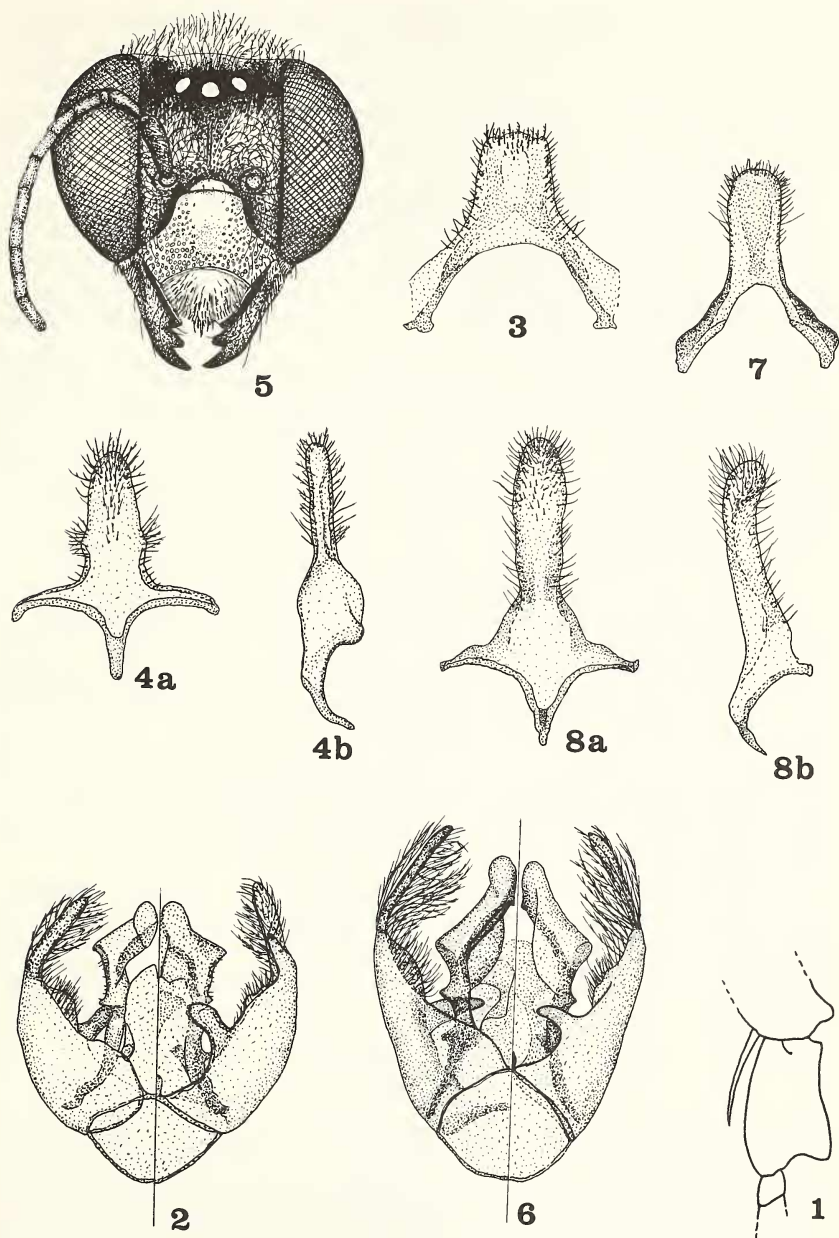
***Centris (Paracentris) fisheri*, new species**

Figures 5-8

Diagnosis. Male: Inner orbits parallel; labrum and clypeus pale yellow; clypeus dull, without polished median line; tergites polished, with widely scattered fine, piligerous punctures; pubescence on lower third of mesopleuron dark brownish. Female: Unknown.

Description. MALE (Holotype). *Measurements.* HW 4.50; EL 3.05; UFW 2.00; LFW 2.00; TFD 2.00; SL 2.50; WL 11.5; TL 17 mm.

Head (fig. 5). Mandible slender, tridentate, inner tooth triangular. Clypeus moderately broad, CW 1.50 x CL; in profile moderately bulging, most protuberant at midlength; disc dull, coarsely and closely punctate, interspaces closely tessellate, midline slightly raised, extreme base and sides polished. Face broad, inner orbits parallel; UFW = TFD = LFW; TFD 0.65 x EL; TFD 1.54 x OCD. Scape moderately long, about 2.3 x longer than wide, SL 1.43 x 1F; 1F:2F:3F:4F = 35:13:25:25. OD:OOD:IOD = 7:8:13.



FIGURES 1-8. 1-4, *Centris ectypha*, ♂: 1, hind basitarsus; 2, genitalia; 3, sternum VIII; 4, sternum IX (ventral and lateral views). 5-8, *C. fisheri*, ♂: 1, front of head; 2, genitalia; 3, sternum VIII; 4, sternum IX (ventral and lateral views).

Thorax. Mesoscutum closely punctate, except small, sparsely punctate median area, punctures finer than on clypeus; interspaces shiny; scutellum closely, finely punctate, punctures separated by a puncture diameter or more. Propodeum shiny, finely punctate, punctures separated by a puncture diameter or more. Hind femur stout, about 2.5 x longer than wide. Hind basitarsus slender, about 4 x longer than wide.

Abdomen. Terga I-V polished, with widely dispersed, fine punctures on disc from which arise short, fine hairs; tergum VI more closely punctate, especially at sides and toward apical margin; margin of apical segment convex; apical process of eighth sternum about 2.5 x longer than wide, apex slightly convex (fig. 7); process of ninth sternum about 2.8 x longer than wide, broadest beyond midpoint (fig. 8).

Color. Black. Labrum; clypeus, except laterobasal margin; transverse mark on supraclypeal area, pale yellowish. Mandibles, antennae and legs dark brownish, underside of flagellum lighter. Pubescence pale ochreous on head, thorax and first tergum. Lower third of mesopleuron, legs and all terga (beyond first) and sterna brown pubescent. Wings transparent light brown, veins and stigma dark brown.

FEMALE: Unknown.

Type material. Holotype and one paratype male: 5 mi NW San Ignacio, Territorio Sur de Baja California, MEXICO, 11 Oct 1972 (E. M. & J. L. Fisher), deposited in LACM.

Etymology. Named for Mr. Eric M. Fisher, collector of the two known specimens, who has presented many specimens from Lower California to the LACM.

Discussion. Superficially this most closely resembles *C. atripes* but is easily separated by the parallel inner orbits, dull clypeus and polished, virtually impunctate tergites. The proportions of the antennal segments and apical sternites are also different.

The paratype is similar to the holotype, but with the following measurements and proportions: HW 4.90; EL 3.25; UFW 2.10; LFW 2.15; TFD 2.15; SL 2.64; WL 12; TL 15 mm. CW 1.59 x CL. UFW 0.98 x LFW; TFD 0.66 x EL; TFD 1.59 x OCD. SL 1.46 x 1F; 1F:2F:3F:4F=37:14:20:27. OD:OOD:IOD=9:7:12.

***Centris (Paracentris) harbisoni*, new species**

Figures 9-13

Diagnosis. Male: Clypeus and labrum yellow, mandible and scape immaculate; hind femur about twice longer than wide; hind basitarsus almost half as wide as long; terga beyond first black pubescent. Female: Clypeus black; mesopleuron brown pubescent on lower half; clypeus coarsely, closely punctate, without raised impunctate line; first recurrent vein entering second submarginal cell well basad of middle; punctures of scutum and scutellum less than a puncture diameter apart.

Description. MALE (holotype). *Measurements.* HW 4.2; EL 3.0; UFW 1.7; LFW 1.9; TFD 1.7; SL 2.4; WL 10; TL 14 mm.

Head. Mandible slender, tridentate, inner tooth triangular, acute. Clypeus broad, CW 1.48 x CL, not abruptly sloping basad, evenly convex in profile, finely punctate, punctures separated by 1.5-2 diameters, interspaces shiny, without median impunctate line. Face broad, inner orbits slightly convergent above, UFW 0.87 x LFW; TFD 0.58 x EL; TFD 1.52 x OCD. Scape about 2.3 x longer than wide, about 1.06 x 1F; 1F:2F:3F:4F=45:15:18:18. OD:OOD:IOD=8:5:12.

Thorax. Mesoscutum and scutellum finely punctate, punctures about a diameter apart, more separated in middle, interspaces moderately shiny. Mesopleuron finely punctate, punctures about two diameters apart, interspaces moderately shiny. First recurrent entering second submarginal well basad of middle. Hind femur swollen, about twice longer than wide, sharply longitudinally angulate beneath; hind basitarsus (fig. 9) broad, almost half as wide as long.

Abdomen. Terga moderately shiny, finely, closely piligerously punctate; apex of last tergum broadly rounded; apical process of eighth sternum about as broad as long, apex truncate (fig. 11); apical process of ninth sternum a little over twice longer than wide, broadest subbasally (fig. 12).

Color. Blackish. Labrum; clypeus, except lateral margins; short paracocular stripe; triangular supraclypeal mark, all yellowish white. Tegulae light brownish yellow. Tarsal segments dark reddish. Wings hyaline, veins and stigma brown. Pubescence brown on legs, lower half of propodeal side, thoracic venter, abdominal segments beyond first; otherwise whitish, tinged with fulvous on thoracic dorsum.

FEMALE (Allotype). *Measurements.* HW 4.35; EL 2.80; UFW 2.25; LFW 2.20; TFD 2.35; SL 2.60; WL 10; TL 14 mm.

Head. Mandible slender, quadridentate. Clypeus broad, CW 1.60 x CL; evenly convex in profile; disc coarsely, contiguously punctate, midline roughened and irregular, not raised, smooth or shiny. Face broad, inner orbits slightly divergent above, UFW 1.02 x LFW; TFD 0.84 x EL; TFD 1.88 x OCD. Scape about 2.6 longer than wide, slightly longer than 1F; 1F:2F:3F:4F=51:13:15:15. OD:OOD:IOD=8:10:12.

Thorax. Similar to male, except usual sexual differences; basitibial plate as in fig. 13.

Abdomen. Similar to male, except usual sexual differences; pygidium narrowly truncate at apex, secondary plate broad, triangular, apex slightly prolonged.

Color. Very similar to male, but without pale face marks; lower half of mesopleura brownish pubescent; pubescence of scutum and scutellum more strongly tinged with fulvous.

Type material. Holotype male: Bahía San Francisquito, Baja California, MEXICO, 3 Apr 1947 (C. F. Harbison). Allotype female: 7 mi W Bahía San

Francisquito, Baja California, MEXICO, 14 Apr 1947 (C. F. Harbison). Paratypes: 1 ♂, same data as holotype; 1 ♀, 3 mi S Okie Landing, Baja California, MEXICO, 21 Mar 1970 (E. M. Fisher). All type material in LACM.

Etymology. Named for the collector of the primary type material, C. F. "Harbie" Harbison.

Distribution. Known only from the Gulf side of Baja California, Mexico.

Discussion. The combination of black clypeus and pale thoracic pubescence in the female occurs in but two other described North American species: *angustifrons* and *lanosa*. The former of these may be readily separated from *harbisoni* by the much narrower facial quadrangle, which is longer than wide, and by the finely, sparsely punctate clypeus with a broad, impunctate median line. In *lanosa* the median impunctate line is narrow, as in *harbisoni*, but is sharply defined and distinctly raised. The punctures of the scutum and scutellum are dense in *harbisoni*, separated by less than a puncture diameter; in *lanosa* the interspaces are greater than a puncture diameter, at least in the center of these segments.

The broadened hind femur and basitarsus will readily separate the male of *harbisoni* from those of all other species except *ectypha*. The mesopleuron of *ectypha* is finely and sparsely punctate, with the punctures shallow and ill-defined. In this species, also, the punctures of the center of the scutum are much more separated than are those of the scutellum. In *harbisoni* the scutum, scutellum and mesopleuron are all closely, finely punctate, the punctures well-defined.

Centris (Paracentris) lanosa Cresson

Centris lanosa Cresson, 1872. Amer. Entomol. Soc., Trans. 4:284. ♂.

Centris subhyalina Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:69. ♀. NEW SYNONYMY.

Centris birkmanii Friese, 1900. Termész. Füzetek 23:44. ♂ ♀. NEW SYNONYMY.

Centris lanosa lanosa, Mitchell, 1962. N. C. Exp. Sta. Tech. Bull. 152:334-355 ♀ ♂.

Centris (Paracentris) subhyalina, Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:8-10. ♂ ♀.

Centris lanosa has been our most consistently misunderstood species. Cresson (1872) based this name on a series of males from Texas. Cockerell (1897) recorded males from Las Cruces, New Mexico, which he thought belonged to Cresson's species and associated females with them. Although not questioning the validity of Cockerell's identification of these males, Fox (1899) expressed the view that the females were actually those of *C. hoffmanseggiae* Cockerell; the females assigned by Cockerell to *C. hoffmanseggiae* were renamed *C. cockerelli* Fox. No female was assigned by Fox to *C. lanosa*, but he did remark that his *C. subhyalina* might be the female.

That *C. cockerelli* might be the true female of *C. lanosa*, as interpreted by Cockerell from the Las Cruces area, was ventured by Cockerell (1900).

Cockerell (1906) listed *C. lanosa* from "Texas, L. Cal., Sonora," but advanced no remarks concerning the sexes or the identity of the species; *C. cockerelli* was listed from New Mexico and California; *C. subhyalina* from Texas, questionably the female of *C. lanosa*.

Lutz and Cockerell (1920) proposed no changes in the status of any of these names but Cockerell (1923) described as new *C. cockerelli resoluta* from Baja California. The California species of *Centris* were enumerated by Timberlake (1940). He recorded the presence of *C. cockerelli*, noting that this was certainly the same as the bee recorded by Cockerell and Fox as *C. lanosa* from Nw Mexico and southern California and pointed out that the male did not quite agree with Cresson's original description of *C. lanosa*. He commented that the California form is probably not more than subspecifically distinct.

The first concrete arrangement of these names was made by Michener (1951 in Muesebeck, et al.) who listed the names as follows: *C. lanosa lanosa* (= *C. cockerelli*), *C. lanosa resoluta*, and *C. subhyalina* (possibly = *lanosa*). This arrangement was slightly modified by Snelling (1956) who proposed that *C. lanosa resoluta* be placed in synonymy. Mitchell (1962) recorded *C. lanosa lanosa* from Florida and redescribed the species, but Snelling (1966) pointed out that Mitchell's record was based on *C. subhyalina*, and that *C. birkmanni* was a synonym of *C. subhyalina*. The proposal that *C. subhyalina* was a synonym of *C. lanosa* (teste Timberlake, in Krombein, 1958) was rejected on what then seemed good evidence. In that same paper I resurrected *C. lanosa resoluta*.

Subsequently, I have examined type material of *C. lanosa* and found that Cresson's material is conspecific with males of *C. subhyalina* and *C. birkmanni* and these names are here synonymized with that. Material previously assigned to *C. lanosa* from New Mexico westward belongs to a separate species, for which the name *C. cockerelli* is available, with the western form separable as a subspecies, *C. cockerelli resoluta*. The true *C. lanosa*, as here understood, is known only from Kansas, central Texas and western Florida.

Centris (Paracentris) mexicana F. Smith

Centris mexicana F. Smith, 1854. Cat. Hymen. Brit. Mus. 2:378. "♀" = ♂.

Centris (Melanocentris) mexicana, Friese, 1900. Ann. K. K. Naturh. Hofmus. Wein, 15:289. ♀ ♂.

Centris (Ptilotopus) mexicana, Cockerell, 1906. Amer. Entomol. Soc., Trans. 32:73, 97.

Centris (Penthemisia) mexicana, Michener, 1951. Kans. Entomol. Soc., Jour. 24:4.

Centris (Paracentris) mexicana, Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:10, 19, 21. ♀ ♂.

Dr. I. H. H. Yarrow has advised me (*in litt.*) that the type of this species, in the British Museum (Natural History) is a male, not a female as originally stated by Smith. Smith's description fails to mention the characteristic color of

the thoracic hairs, but Dr. Yarrow confirmed the usual interpretation of this species.

Friese (1900) described *C. albiceps* as a variety of *C. mexicana* based on males in which the labrum and clypeus are said to be whitish. If I correctly interpret the very brief sentence by which this form was characterized, the integument, and not the hair, is whitish. No *Paracentris* resembling *C. mexicana* is known to me which possesses a whitish labrum and clypeus in the male. I assume that *C. albiceps* belongs to another subgenus; it may be an earlier name for *strawi* Snelling, here placed in the subgenus *Acritocentris*, and described below. Until the type can be studied, *C. albiceps* must be considered unrecognizable.

This species was described from an unspecified locality in Mexico; Friese (1900) recorded it from Orizaba (Veracruz) and Cockerell (1906) from Cuernavaca (Morelos). The following records will considerably amplify the distribution of *C. mexicana*. MEXICO. *Durango*: 11 ♀♀, 12 ♂♂, Durango, 6200', 14 Aug 1947 (Cazier, Gertsch, Michener; D. Rockefeller Exped.; AMNH); 1 ♂, La Quebrada, 20 July 1947 (Michener; D. Rockefeller Exped.; AMNH); 1 ♂, Yerbanis, 6700', Cuencame Dist, 19 Aug 1947 (Michener; D. Rockefeller Exped.; AMNH); 3 ♂♂, San Juan del Rio, 5200', 30 July 1947 (Michener, Spieth; D. Rockefeller Exped.; AMNH). *Michoacan*: 6 ♀♀, 1 ♂, Apatzingan, 1200', 1-7 Aug 1940 (Hoogstraal and Knight; AMNH). *Nuevo Leon*: 2 ♀♀, 5 ♂♂, Galeana, 5-6000', 30 July and 3 Aug 1939 (R. Haag; MCZ). *Chihuahua*: 2 ♂♂, Agua Caliente, Santa Barbara Dist, 24 July 1947 (Michener; D. Rockefeller Exped.; AMNH); 1 ♀, 6 mi NE Meoqui, 2 Sept. 1950 (R. F. Smith; AMNH); 1 ♀, Delicias, 13 July 1947 (Michener; D. Rockefeller Exped.; AMNH); 1 ♀, 20 mi SW Camargo, 4500', 13 July 1947 (Michener; D. Rockefeller Exped.; AMNH), on *Cevallia sinuata*; 1 ♀, Salaices, 5200', 20 Aug 1947 (G. M. Bradt; AMNH). *Sonora*: 1 ♂, San Luis, Sept-Oct (Palmer; MCZ). *Distrito Federal*: 3 ♂♂, Chapultepec, 5 July 1897 (Koebele colln.; CAS). UNITED STATES. *Arizona*: 2 ♂♂, South West Research Station, 5400', 5 mi W Portal, Cochise Co, 18 July 1956 (C. & M. Cazier; AMNH), on *Melilotus alba*; 1 ♀, 6.0 mi SW Bisbee, 4800', Cochise Co, 29 July 1973 (T. J. Zavortink; TJZ), on *Menodora scabra*, 0630-0645 hrs; 1 ♀, same locality and collector, 30 July 1973, on *M. scabra*, 0630-0645 hrs. *New Mexico*: 1 ♀, McMillan Camp, 6800', 13 mi N Silver City, Grant Co, 19 July 1961 (F., P. & J. Rindge; AMNH); 1 ♂, Rock Hound State Park, 4600', 9 mi SE Deming, Luna Co, 14 Aug 1973 (T. J. Zavortink; TJZ), on *Hoffmanseggia densiflora*, 1330-1345 hrs. *Texas*: 2 ♂♂, Big Bend Natl Park, Brewster Co, 16 June 1948 (M. Cazier; AMNH); 1 ♀, 16 mi W Sanderson, Pecos Co, 23 June 1970 (E. M. Fisher; LACM).

Centris (Paracentris) rhodopus Cockerell

Centris caesalpiniae var. *rhodopus* Cockerell, 1897. Ann. Mag. Nat. Hist. (6)19: 394. ♀ ♂.

- Centris rhodopus*, Fox, 1899. Acad. Nat. Sci. Phila., Proc. 51:64, 65, 68. ♂ ♀;
Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:559; Timberlake,
1940. Pan-Pacific Entomol. 16:138.
- Centris (Melanocentris) rhodopus*, Friese, 1900. Ann. K. K. Naturh. Hofmus. Wein
15:297. ♀ ♂.
- Centris rhodopus* var. *pulchrior* Cockerell, 1900. Canad. Entomol. 32:363. ♂.
- Centris (Ptilotopus) rhodopus*, Cockerell, 1906. Amer. Entomol. Soc., Trans. 32:97.
- Centris rhodoleuca* Cockerell, 1923. Calif. Acad. Sci., Proc. (4)12:75. ♂; Timberlake, 1940. Pan-Pacific Entomol. 16:5. NEW SYNONYMY.
- Centris (Penthemisia) rhodopus*, Michener, 1950. Kans. Entomol. Soc., Jour. 24:4;
Snelling, 1956. Pan-Pacific Entomol. 32:3, 4, 6. ♂ ♀.
- Centris (Trichocentris) rhodoleuca*, Snelling, 1956. Pan-Pacific Entomol. 32:4-5.
- Centris (Paracentris) rhodopus*, Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:20,
21. ♀ ♂.

The form described by Cockerell as *C. rhodoleuca* differs from typical males of *C. rhodopus* primarily in the larger size, exceptionally stout femora and the abundance of long, shaggy white pubescence over the entire body, including the abdomen. This form, described from Lower California, has been known from a few specimens from southern California and Nevada. A male specimen from Rock Hound State Park, 4600', 9 mi SE Deming, Luna Co, NEW MEXICO, 26 Aug 1973 (T. J. Zavortink; TJZ), on *Cevallia sinuata*, 1600-1615 hrs, is intermediate between *C. rhodoleuca* and *C. rhodopus*. The femora, stouter than in *C. rhodopus*, are not as stout as in *C. rhodoleuca*. The terga are blackish, but with broad hyaline apical margins. The pubescence is shaggier than in *C. rhodopus*, but not as shaggy as in *C. rhodoleuca*. On the second and third terga it is appressed as in *C. rhodopus* but pale as in *C. rhodoleuca*; on the remaining segments it is erect and pale, as in *C. rhodoleuca*, but shorter than in that form. The hairs on the outer face of the hind basitarsus are pale, as in *C. rhodoleuca*. In size, the specimen is intermediate between the two forms.

Another male, also collected by Zavortink, 5 mi ESE Deming, 4200', Luna Co, NEW MEXICO, 15 Aug 1973, on *Hoffmanseggia densiflora*, 1015-1030 hrs, is similar, but more like typical *C. rhodopus*. In this specimen, the pubescence of the hind basitarsus is pale; that of the second and third terga is pale, with interspersed black hairs in the middle.

With these specimens at hand, it appears that *C. rhodopus* produces occasional aberrant individuals in a manner similar to those of *C. pallida* and *C. caesalpiniae*. Hence *C. rhodoleuca* must now be placed in the synonymy of *C. rhodopus*.

Centris (Paracentris) zacateca Snelling

- Centris (Paracentris) zacateca* Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:11-12. ♀ ♂.

The following new records extend somewhat the range of this basically Mexican species.

NEW RECORDS. UNITED STATES. *Arizona*: 2 ♂♂, 0.7 mi W Portal, 4900', Cochise Co, 3 Aug 1972 (T. J. Zavortink; TJZ), 0850-0950 hrs, on *Hoffmanseggia densiflora*, 1 ♂, South West Research Station, 5400', 5 mi W Portal, Cochise Co, 10 Aug 1956 (C. & M. Cazier; AMNH), on *Melilotus alba*; 1 ♀, same locality as above, 8 Aug 1956 (E. Ordway; AMNH), on *M. alba*; 1 ♀, Carr Cyn, 5400', Huachuca Mts, Cochise Co, 21-23 Aug 1972 (R. R. Snelling; LACM); 1 ♀, Yaqui Spg, 5500', Huachuca Mts, Cochise Co, 28 Aug 1972 (R. R. Snelling; LACM). *New Mexico*: 1 ♀, Las Cruces, Doña Ana Co, 18 July 1963 (J. Lopez; Univ. New Mexico); 2 ♂♂, 1.4 mi E Animas, Hidalgo Co, 11 Aug 1972 (T. J. Zavortink; TJZ), on *Hoffmanseggia densiflora*, 0700-0730 hrs; 1 ♀, 1 ♂, same locality, 16 Aug 1972 (T. J. Zavortink; TJZ), on *H. densiflora*, 1000-1030 hrs.

Subgenus *TRACHINA* Klug

***Centris (Trachina) heithausi*, new species**

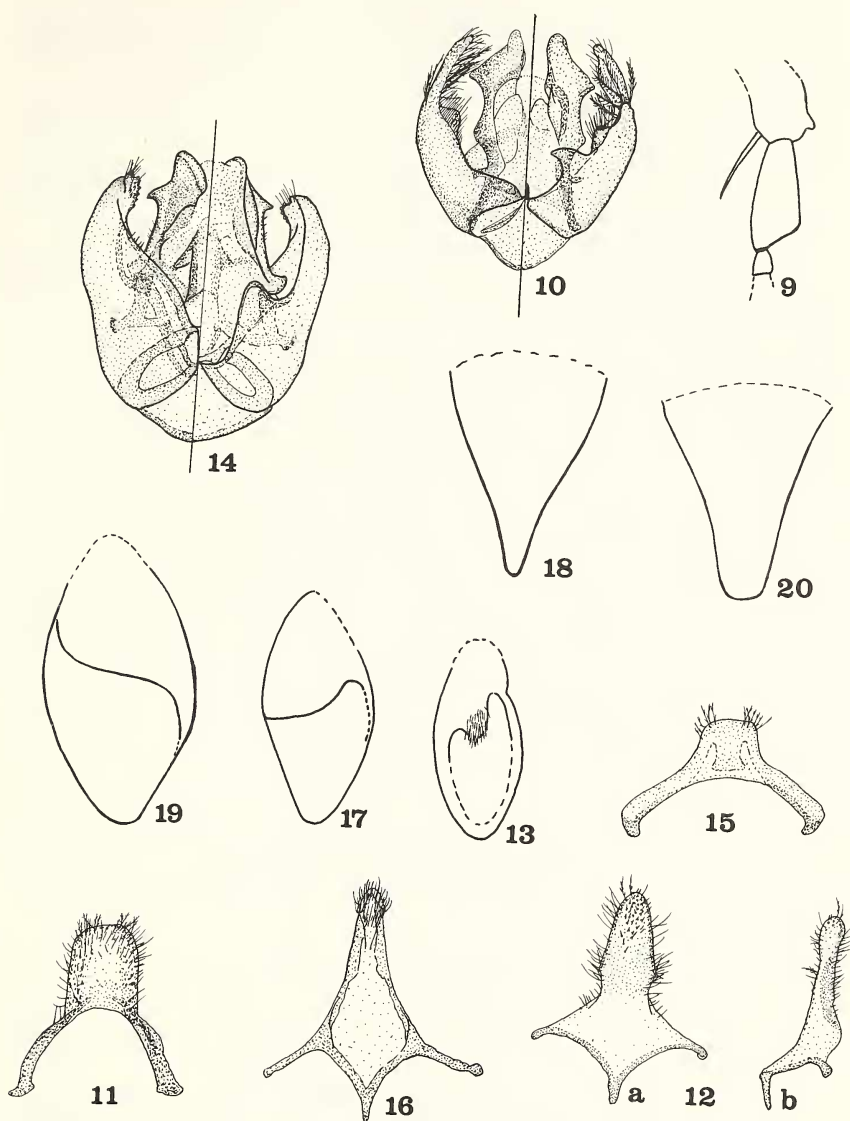
Figures 14-18

Diagnosis. Thoracic pubescence whitish, costal margin of fore wing blackish; abdomen bright, clear ferruginous. Female: basitibial plate as in fig. 17; pygidial plate with margins evenly convergent apicad, not reflexed; inner mandibular tooth subacute; scape dark beneath. Male: inner mandibular tooth broad, obliquely truncate, weakly emarginate; hind femoral process broader than high; hind tibia bicarinate, process elongate, straight; hind basitarsal carina produced distad as a broad tooth, ending beyond midlength of segment; ninth sternum slender.

Description. MALE (Holotype). *Measurements.* HW 5.20; EL 3.50; UFW 1.75; LFW 2.45; TFD 2.15; SL 0.68; WL 13; TL 15 mm.

Head. Mandible moderately stout, tridentate, inner tooth broad, obliquely truncate, the truncation slightly concave. Clypeus broad, CW 1.58 x CL, abruptly sloping basally; disc nearly flat in profile; median line not defined, punctures of black areas fine, separated by about half a puncture diameter, interspaces dull, densely tessellate; punctures coarser on maculate areas, separated by less than half a puncture diameter, interspaces shinier, especially below. Face broad, inner orbits moderately convergent above, UFW 0.71 x LFW; TFD 0.61 x EL; TFD 1.87 x OCD. Scape about 1.7 longer than wide, 0.61 x 1F; 1F:2F:3F:4F=67:16:20:20. OD:OOD:IOD=8:5:13.

Thorax. Mesoscutum finely, closely punctate, punctures separated by 1/4-1/2 puncture diameter, interspaces shiny; with narrow impunctate median line. Scutellum shiny, very finely punctate, punctures separated by 1-3 puncture diameters. Mesopleural punctures about equal to those of scutum, separated by 1/2-1 puncture diameter. Propodeal sides shiny, punctures fine, irregularly spaced, some punctures elongate. Ventral process of hind femur stout, thicker than high; hind tibia with anterior and posterior carinae complete on inner face, anterior tooth oblique, moderately long; posterior carina



FIGURES 9-20. 9-12, *Centris harbisoni*, ♂: 9, hind basitarsus; 10, genitalia; 11, sternum VIII; 12, sternum IX (ventral and lateral views). 13, *C. harbisoni*, ♀: basitibial plate. 14-16, *C. heithausi*, ♂: 14, genitalia; 15, sternum VIII, 16, sternum IX. 17-18, *C. heithausi*, ♀: 17, basitibial plate; 18, pygidial plate. 19-20, *C. fuscata*, ♀: 19, basitibial plate; 20, pygidial plate.

of hind basitarsus extending about $3/4$ length of segment, terminating in a moderately elongate process. First recurrent vein entering second submarginal cell in basal one-fourth; accessory veinlet of first submarginal cell heavily pigmented.

Abdomen. Terga finely, closely piligerously punctate; seventh tergum apically bilobate; seventh sternum not cleft at apex; apical process of eighth sternum broader than long, posterior margin simple (fig. 15); apical process of ninth sternum elongate, slender, slightly broadened preapically (fig. 16); cusps at apex of gonocoxite stout, acute (fig. 14).

Color. Head blackish, following bright yellow: basal three-fourths of mandible externally; labrum, except margins; transverse apical band on clypeus (much broadened laterad) conjoined with narrow median line; paracocular area to level of antennal socket; underside of scape. Underside of flagellum dark rufescent. Thorax black. Tegulae transparent ferruginous. Fore and mid legs blackish; yellow basal spot on tibia; underside of tibia, all tarsi light rufescent; hind leg mostly dull ferruginous, femur with irregular median infuscation. Abdomen bright, clear ferruginous, more yellowish on first tergum and apical three segments and ventrally. Pubescence mostly whitish, but with abundant brownish hairs around antennal sockets, across vertex and on pronotal lobes. Mesopleuron above with hairs slightly tinged with brownish. Pubescence of legs mostly whitish to light ferruginous, brownish on underside of mid and hind femora, tibiae and anteriorly on basitarsi; brighter on hind leg. Discal hairs of terga 2-4 fuscous, longer at sides; ferruginous apically and ventrally, especially long and dense on sterna 4-6. Wings transparent brownish, veins and stigma black; costal margin conspicuously darker to about middle of marginal cell.

FEMALE (Allotype). Measurements. HW 5.50; EL 3.75; UFW 2.55; LFW 2.95; TFD 3.05; SL 0.88; WL 13.0; TL 18.0 mm.

Head. Mandible moderately stout, tridentate, inner tooth broadly triangular, acute. Clypeus broad, CW 1.68 x CL, similar to that of male. Face broad, UFW 0.86 x LFW; TFD 0.81 x EL; TFD 2.04 x OCD. Scape about twice longer than wide, SL 0.71 x 1F; 1F:2F:3F:4F = 75:15:20:20. OD:OOD:IOD = 8:9:17.

Thorax. Similar to that of male; basitibial plate as in fig. 17.

Abdomen. Similar to that of male, except usual sexual differences; pygidial plate (fig. 18) with margins evenly convergent toward narrowly truncate apex, margins not reflexed.

Color. Much as in male, but scape dark beneath. Without conspicuously brownish hairs around antennal sockets; hairs across vertex light brownish; hairs of pronotal lobe pale; scopa yellowish white; costal margin of forewing infuscated beyond apex of marginal cell.

Type material. Holotype male and allotype female: COSTA RICA, Guanacaste Prov: Hacienda Comelco, elev 50 m, 24 km NW Cañas, 16 Feb 1972 (E. R. Heithaus; #18329 (δ), #18215), on *Caesalpinia*, at 1000 (δ).

and 0730 hrs (♀). Paratypes, same locality and collector: 5 ♂♂, 2 ♀♀, 12 Feb 1972, on *C. eriostachys*, 0830-0945 hrs; 10 ♂♂, 13 ♀♀, same date, on *Gliricidia* sp., 0920 hrs; 8 ♂♂, 17 ♀♀, 14 Feb 1972, on *C. eriostachys*, 0730-1015 hrs; 5 ♂♂, 32 ♀♀, 16 Feb 1972, on *Caesalpinia*, 0730-1000 hrs; 1 ♀, 22 Feb 1971, on *Byrsonema crassifolia*, 0800 hrs; 1 ♂, 6 Mar 1972, on legume, 0800; 1 ♀, 7 Feb 1972, on *B. crassifolia*, 0730-0830 hrs. One paratype pair to the following: AMNH, UK, USNM and E. R. Heithaus. Holotype, allotype and remaining paratypes in LACM.

Etymology. This species is named for the collector of the type series.

Distribution. Known at present only from Guanacaste Province, Costa Rica. Two additional specimens are from Hacienda La Pacifica, 5 km NW Cañas, a female, 7 Jan 1972, a male, 20 Jan 1972 on *Cassia* sp., both collected by Heithaus.

Discussion. This species most closely resembles *C. fuscata* Lepeletier, with which it is sympatric at the type locality, but both sexes lack the yellow to light ferruginous color of the thoracic pubescence and the basal area of the propodeum is densely tessellate. In the female of *C. fuscata* the median line of the clypeus is distinctly raised, the scape is maculate beneath, the fore tibia has an external stripe, the basitibial plate is different (fig. 19), and the pygidial plate is abruptly narrowed to a rounded apex (fig. 20). In the male of *C. fuscata* the process of the hind femur is higher, the carina of the hind basitarsus is much shorter, the clypeus yellow, except two subbasal lateral spots, the fore tibia with an external yellow stripe.

The color of the thoracic pubescence is much like that of *C. carrikeri* Cockerell of Trinidad, but in that species the wings are light basally, dark beyond the basal vein. In both sexes the scutellum is flattened in the middle, depressed in the middle at the summit of the declivity. The scape is yellow beneath in both sexes.

VARIATION IN CEPHALIC CHARACTERS

	<i>TFD</i> × <i>EL</i>	<i>UFW</i> × <i>LFW</i>	<i>TFD</i> × <i>OCD</i>	<i>CW</i> × <i>CL</i>	<i>SL</i> × <i>SW</i>	<i>SL</i> × <i>IF</i>
♀ ♀	0.76-0.81	0.83-0.91	1.87-2.14	1.50-1.71	1.77-2.18	0.64-0.74
♂ ♂	0.56-0.63	0.71-0.75	1.52-1.87	1.44-1.59	1.75-2.00	0.58-0.70

Subgenus *CENTRIS* Fabricius

Centris (Centris) aethyctera, new species

Figures 21-26

Centris fasciatella Friese, 1900. Hofmus. Naturh., Ann. K. K. Wien, 15:332 (part). *Centris fasciata*, Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:553 (part).

Diagnosis. Pubescence mostly pale; terga beyond first with broad, uninterrupted transverse yellow fasciae, apical margins transparent; pubescence

of mesoscutum black-tipped. Female: external hairs on fore and mid tibiae and tarsi light; appressed discal hairs of second and third terga fuscous; scape yellow beneath; fore tibia with a complete stripe on outer face and an evanescent one anterior to it. Male: face broad, UFW 0.80 x LFW; discal hairs of second and third terga fuscous; fore tibial stripe complete; scape longer than 1F.

Description. MALE (Holotype). *Measurements.* HW 4.90; EL 3.35; UFW 1.80; LFW 2.25; TFD 1.90; SL 0.73; WL 9.5; TL 15 mm.

Head (fig. 21). Mandibles slender, tridentate, inner tooth acute. Clypeus wide, CW 1.4 x CL, apical margin nearly straight; in profile, sharply sloping toward base; disc flat, raised on either side slightly below summit of basal slope, with barely indicated raised median line. Face broad, TFD 0.56 x EL, UFW 0.80 x LFW; TFD 1.65 x OCD. Scape short, slightly longer than 1F (44:41); 1F:2F:3F:4F = 41:12:24:23. OD:OOD:IOD = 8:5:14. Sloping clypeal sides clearly punctate, punctures separated by a puncture diameter or more, finer and denser basad, disc irregularly, finely roughened and tessellate, with scattered punctures, shinier and less roughened along midline.

Thorax. Mesoscutum closely, finely punctate, interspaces shiny, median line less closely punctate; scutellum shiny, finely punctate, interspaces variable, but mostly one to two puncture diameters; pleura finely, closely punctate, interspaces densely tessellate and slightly shiny; propodeal side closely, finely punctate, lightly tessellate and slightly shiny, basal and posterior areas shinier, very lightly tessellate, with scattered fine punctures. Second recurrent vein entering first submarginal cell at basal third. Hind femur about 2.5 x longer than wide, sharply longitudinally angulate beneath but not carinate; hind basitarsus simple.

Abdomen. Terga closely, finely piliferously punctate, interspaces shiny; pygidium apically bilobate, with short, low median ridge basally. Eighth sternum with apical margin of process emarginate (fig. 24); apical process of ninth sternum gradually widened toward apex (fig. 25); ventral process of gonocoxite elongate, narrowly rounded apically; inner dorsal angle of gonocoxite nearly right angular (fig. 23).

Color. Head blackish, the following light yellow: basal three-fifths of mandible externally; labrum, clypeus (except elongate laterobasal mark), narrow transverse supraclypeal mark, narrow paracocular stripe to level of clypeal base, malar area, underside of scape. Underside of flagellum dark ferruginous. Thorax black, scutellum light reddish. Legs mostly ferruginous; fore tibia with complete longitudinal stripe externally; mid tibia with evanescent external stripe; all femora and hind tibiae with blackish blotches; hind tibia with basal yellow mark. Abdomen: first tergum ferruginous, with yellow macula on each side, apical margin broadly transparent; second tergum reddish before gradulus, narrowly blackish with greenish reflections behind gradulus, disc largely light yellow, with wide apical transparent band; remaining terga similar, but last wholly ferruginous; sterna ferruginous. Hairs

mostly pale, but with conspicuous fuscous hairs on frons and in transverse band on vertex; hairs of scutum and scutellum black-tipped; hairs of tarsi mostly reddish, some fuscous on inner side of hind basitarsi.

FEMALE (Allotype). *Measurements*. HW 5.70; EL 3.65; UFW 2.55; LFW 2.85; TFD 3.00; SL 0.83; WL 11.0; TL 15 mm.

Head (fig. 22). Mandibles slender, tridentate, inner tooth acute. Clypeus wide, CW 1.5 x CL, similar to that of male, but sides and base less sharply sloping, shinier, with distinct, slightly raised median impunctate line sub-basally. Face broad, TFD 0.82 x EL; UFW 0.89 x LFW; TFD 2.5 x OCD. Scape about twice longer than wide, SL 0.76 x 1F; 1F:2F:3F:4F = 65:13:19:20, OD:OOD:IOD = 9:9:17.

Thorax. Scutum and scutellum equally finely, closely punctate; shiny; pleural punctures slightly coarser, dense, interspaces moderately shiny. Fore basitarsus, on inner face, with usual anterior row of short flattened setae and about four elongate, apically spatulate setae on posterior margin; mid basitarsus with anterior row of short, flattened setae beneath.

Abdomen. Similar, except usual sexual differences, to that of male; pygidium narrowly rounded or subtruncate apically.

Color. Much as in male, but clypeus with median stripe not reaching base and with a narrow median spot at apex; fore tibia with evanescent yellow stripe anterior to usual one on outer face. Hairs much as in male, but with fuscous hairs much less numerous on frons below level of ocelli; scopal hairs whitish.

Type material. Holotype male: COSTA RICA, Guanacaste Prov: Hacienda Comelco, elev 50 m, 24 km NW Cañas, 16 Feb 1972 (E. R. Heithaus #18355), collected 1000 hrs, on *Caesalpinia eriostachys*. Allotype female: same locality and date (E. R. Heithaus #18163), collected 0730 hrs, on *C. eriostachys*. Paratypes, all from type locality: (E. R. Heithaus): 2 ♂♂, 2 ♀♀, 12 Feb 1972, on *Gliricidia* sp.; 44 ♂♂, 2 ♀♀, 12 Feb 1972, on *C. eriostachys*; 60 ♂♂, 7 ♀♀, 14 Feb 1972, on *C. eriostachys*; 2 ♂♂, 16 Feb 1972, on *Andira inermis*; 42 ♂♂, 15 ♀♀, 16 Feb 1972, on *C. eriostachys*; 5 ♂♂, 13 Mar 1971, on *Securidacea tenuifolia*; 1 ♂, 15 Mar 1971, on *S. tenuifolia*; 1 ♂, 16 Mar 1971, on *S. tenuifolia*; 2 ♀♀, 16 Mar 1971, on *Byrsonema crassifolia*; 1 ♀, 21 Mar 1971, on *B. crassifolia*; 1 ♂, 21 Apr 1971, on *Arrabidaea corallina*. One paratype pair to each of the following: AMNH, BMNH, TAMU, UK, USNM, E. R. Heithaus; Holotype, Allotype and remaining paratypes in LACM.

Etymology. Gr., *aithykte*, darter, because of the swift, elusive manner of flight.

Distribution. Northwestern Mexico to Costa Rica. **ADDITIONAL MATERIAL**. MEXICO. 2 ♂♂, 7 ♀♀, Cocorit, Sonora, 11 June 1961 (A. Menke & L. Stange; LACM); 1 ♂, 10 mi S Alamos, Sonora, 13 June 1961 (F. D. Parker; LACM); 1 ♀, Rosario, Sinaloa, 24 June 1963 (J. Doyen; LACM). GUATEMALA. 1 ♂, 1 ♀, Los Amates, no date (Kellerman;

LACM); 5 ♂♂, no specific locality, 300 m elev, 28 Mar-3 Apr 1923 (AMNH). COSTA RICA, Guanacaste Prov.: 8 ♂♂, 2 ♀♀, 2 km S Liberia, 1 Mar 1972 (G. W. Frankie; LACM), on *Andira inermis*; 21 ♀♀, 25 ♂♂, Pan Amer. Hwy, 3 km SE Liberia, 26 Feb 1972 (G. W. Frankie; LACM, TAMU), on *A. inermis*, 1200-1300 hrs; 1 ♀, Palo Verde, 16 Feb 1972 (C. E. Jones; LACM).

Discussion. This species closely resembles *C. eisenii* W. Fox of Mexico and *C. fasciata* F. Smith of the West Indies. Central American records of the latter name probably all apply to *C. aethyctera*. From *C. eisenii*, females of the present species may be separated by smaller size, presence of dark appressed hairs on the second and third terga, presence of erect plumose white hairs on the fourth tergum and the presence of apical fasciae of plumose hairs on the second and third terga. The legs of the Mexican species are dark rufescent, with the pubescence of the middle pair dark brownish; the fore tibia is without an external yellow stripe. The antennal scape of *C. eisenii* is immaculate and is much shorter than 1F, the clypeus is wholly yellow, the legs are dark, the fore tibia lacks a yellow stripe and the fourth tergum is without plumose hairs. Also, the hairs of the thoracic dorsum lack blackish apices.

One male specimen possesses a scape which is slightly shorter than the first flagellar segment ($0.96 \times 1F$). In all other males, SL is at least equal to 1F.

VARIATION IN CEPHALIC CHARACTERS

	$TFD \times EL$	$UFW \times LFW$	$TFD \times OCD$	$CW \times CL$	$SL \times SW$	$SL \times 1F$
♀♀	0.81-0.85	0.83-0.91	2.15-2.54	1.48-1.61	2.00-2.36	0.74-0.84
♂♂	0.56-0.68	0.76-0.86	1.59-1.82	1.41-1.54	1.75-2.04	0.96-1.09

The female of *C. aethyctera* differs from that of *C. fasciata* in possessing ferruginous legs, fore tibia with a yellow stripe from base to apex, hairs of pronotal lobe and upper mesopleura not black-tipped, second and third terga with apical fascia of appressed plumose hairs and the fourth tergum with sparse erect plumose white hairs. The legs of *C. fasciata* are dark rufescent and the stripe on the fore tibia extends only a little beyond the middle. The second and third terga lack apical fasciae of pubescent hairs and there are no erect plumose hairs on the disc of the fourth segment. The scutellum of the one *C. fasciata* female seen is black rather than ferruginous as in *C. aethyctera*, but this probably is of no significance.

The males of *C. fasciata* and *C. aethyctera* are similar, but the first flagellar segment is longer than the scape in *C. fasciata*. In this species, too, the hairs of the pronotal lobe are black-tipped, the legs are dark rufescent and the stripe on the fore tibia extends but half the length of the segment; the fourth tergum is without appressed plumose hairs along the apical margin. The eighth sterna are similar in the two species, but that of *C. fasciata* (fig.

27) is less deeply emarginate at the apex, hence does not appear bilobed as in *C. aethyctera* (fig. 24). The narrowest part of the apical process of the ninth sternum is beyond the middle in *C. fasciata* (fig. 28), basad of the middle in *C. aethyctera* (fig. 25).

***Centris (Centris) erubescens*, new species**

Diagnosis. Female: thorax, abdomen and legs ferruginous, pubescence pale, terga II-IV with distinct apical pubescent fasciae. Male: unknown.

Description. FEMALE (Holotype). *Measurements.* HW 5.45; EL 3.20; UFW 2.45; LFW 2.60; TFD 2.80; SL 0.70; WL 9.35; TL 15 mm.

Head. Mandibles slender, tridentate. Labrum about twice wider than long. Clypeus wide, CW 1.59 x CL, similar to that of *C. aethyctera*, but without distinct raised median line, slightly bulging basally; maculate areas shinier than nonmaculate, punctures fine, irregularly spaced, interspaces irregularly and obliquely raised. Frons closely and finely punctate; vertex shinier, punctures fine, sparse, irregularly spaced. Face broad, TFD 0.87 x EL; UFW 0.94 x LFW; TFD 2.2 x OCD. Scape about twice longer than wide, SL 0.76 x 1F; 1F:2F:3F:4F = 55:10:21:20. OD:OOD:IOD = 8:11:14.

Thorax. Scutum and scutellum similar, finely punctate, punctures separated by about a puncture diameter or less, interspaces shiny; mesopleuron more coarsely and closely punctate, interspaces closely tessellate and dull.

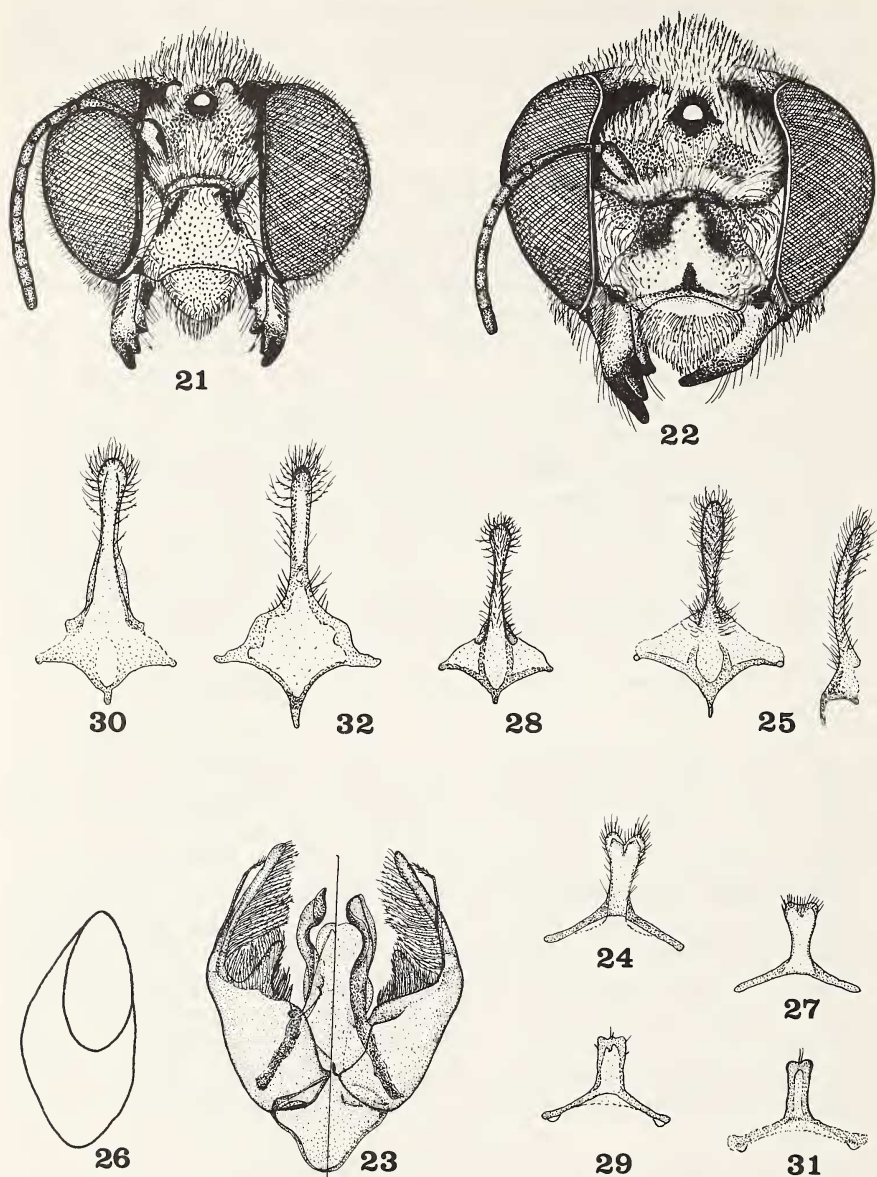
Abdomen. Similar to that of *C. aethyctera*, pygidial apex narrowly truncate.

Color. Head blackish, grading into rufescent on genae, following yellow: basal three-fifths of mandible; malar area; labrum, except dull rufescent margin and apical cloud; para-ocular area to level of antennal socket; median stripe on basal half of clypeus, then curved laterad to apicolateral corner; small supraclypeal spot; small preapical spot on scape. Thorax and legs dull reddish, with irregular blackish areas on pronotum, scutum, pleurae and propodeum; fore and mid tibiae with yellow basal spot, fore tibia with traces of yellow stripe basally. Abdomen wholly dull rufescent, without metallic tints. Pubescence mostly pale; frons and vertex with many black-tipped hairs; hairs of scutum and scutellum minutely fuscous-tipped; hairs on inner side of tibiae and tarsi ferruginous. First tergum with obscure preapical pubescent fascia (best viewed obliquely); terga II-IV with distinct, narrow, whitish apical pubescent fascia, obsolescent in middle on II; apical fimbria on V golden yellow.

Type material. Holotype and one paratype female: MEXICO: 67 km E Escarcega, Campeche, 3 May 1959 (T. C. Emmel), both in LACM.

Etymology. L., *erubesco*, blush or redden, because of the uniformly dull ferruginous abdomen.

Distribution. Known only from the States of Campeche and Yucatán, Mexico.



FIGURES 21-32. 21-22, *Centris aethyctera*, front of head, ♂ and ♀ respectively. 23-25, *C. aethyctera*, ♂: 23, genitalia; 24, sternum VIII; 25, sternum IX. 26, *C. aethyctera*, ♀: basitibial plate. 27-28, *C. fasciata*, ♂: 27, sternum VIII; 28, sternum IX. 29-30, *C. nigrifula*, ♂: 29, sternum VIII; 30, sternum IX. 31-32, *C. flavifrons*, ♂: 31, sternum VIII; 32, sternum IX.

Paratypic variation. The paratype is very similar to the holotype, but is slightly larger; the wings are worn, hence not measured. Measurements and ratios for this specimen are: HW 5.55; EL 3.35; UFW 2.55; LFW 3.02; TFD 2.90; SL 0.78; TL 16 mm; CW 1.58 x CL; TFD 0.87 x EL; UFW 0.93 x LFW; TFD 2.23 x OCD; SL 0.79 x 1F; 1F:2F:3F:4F = 59:10:19:19; OD:OOD:IOD = 7:11:16.

Discussion. This distinctive species, presently known only from three specimens, is easily recognized by the dull, wholly ferruginous abdomen with narrow pubescent fasciae on terga II-IV. It apparently is not closely related to other species of *Centris*, s. str., with pubescent fasciae, for in these the fasciae are much broader, the fourth tergum is densely covered with erect plumose hairs and the first four terga are metallic greenish or blue-green.

A single specimen, not a paratype, is from Piste, Yucatán, 12 June 1967 (E. C. Welling; LACM). This female is in most respects like the two from Campeche and is certainly conspecific. It differs from these in lacking the ferruginous areas on the thorax and the first two terga possess irregular blue-green blotches basally. The legs are a little more brownish.

Centris (Centris) fasciata F. Smith

Figures 27-28

Centris fasciata F. Smith, 1854. Cat. Hymen. Brit. Mus. 2:377. ♀ ♂.

Centris fasciatella Friese, 1900. Hofmus. Naturh., Ann. K. K. Wien. 15:332. New name for *C. fasciata* F. Smith, nec *C. fasciata* Lepeletier, 1825.

When Friese (1900) monographed *Centris*, he included species now placed in the genus *Epicharis*. Consequently, *C. fasciata* F. Smith, 1854, was preoccupied by *C. fasciata* Lepeletier, 1825; Friese proposed *C. fasciatella* for Smith's species. Since *Epicharis* is now recognized as a separate genus, Smith's name is once more available.

Smith's *C. fasciata* was based on both sexes from Jamaica, West Indies. Friese (1900) reported the species present in Mexico and Brazil. I have seen no material from South America referable to this form, but find that specimens under this name from Central America are a different species, described above as *C. aethyctera*.

This species resembles *C. aethyctera* and *C. eisenii* in having the pubescence pale and the abdomen with broad yellow fasciae on segments II-V (♀♀) or II-VI (♂♂). The hairs of the vertex are black-tipped over the apical one-third to one-half in the female, the male with many hairs wholly dark. The hairs of the mesoscutum and scutellum are black-tipped, as are those of the pronotal lobes and the hypopimeral area. In both sexes the dorsal face of the first tergum is light metallic green (at least partially ferruginous in the other species); the fourth tergum is without erect plumose hairs on the disc (true also of *C. eisenii*).

Centris (Centris) inermis Friese

Centris inermis Friese, 1899. Termész. Füzetek 23:46. ♂ ♀; Ann. K. K. Naturh. Hofmus. Wein 15:314; Cockerell, 1928. Psyche 35:173; 1949, U. S. Natl. Mus., Proc. 98:479.

Centris inermis gualanensis Cockerell, 1912. Ann. Mag. Nat. Hist. (8)9:568. ♀ ♂; Schwartz, 1934. Amer. Mus. Nov. 722:12; Michener, 1954. Amer. Mus. Nat. Hist., Bull. 104:138-139; Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:22. NEW SYNONYMY.

Centris inermis pallidifrons Cockerell, 1949. U. S. Natl. Mus., Proc. 98:479. ♂.

Long series of specimens from Costa Rica demonstrate that the dark legged form described by Cockerell from Guatemala (Gualan and Quirigua) as the subspecies *gualanensis* is not distinguishable from the nominate form. Friese recorded *C. inermis* from Brazil, Peru, Colombia and Panama. In the South American material, the legs of both sexes are largely ferruginous, with the fore tibiae a little darker. The Guatemalan material of Cockerell was characterized by darker legs, with little ferruginous. The Costa Rican samples exhibit a great deal of variation and, while the legs are, on the whole, somewhat more infuscated than in most South American material, the difference hardly seems significant.

Centris (Centris) nigrityla Friese

Figures 29-30

Centris flavifrons var. *nigrityla* Friese, 1899. Termész. Füzetek 23:46. ♀.

Centris nigrityla, Cockerell, 1926. Ann. Mag. Nat. Hist. (9)17:518-519. ♀ ♂.

Friese's type female was erroneously labelled "Afrika," but Cockerell recognized specimens from Trinidad, British West Indies, as belonging to this form, which he felt should be accorded species status. A long series of both sexes (mainly males) from Trinidad (Manzanilla and Curepe) is in the AMNH. After examining these specimens, I tentatively agree with Cockerell.

Superficially, the females of the two species are obviously different. That of *C. flavifrons* has the thoracic pubescence largely whitish, with a broad band of blackish pubescence between the tegulae and blackish hairs are conspicuous in the scopa, especially on the basitarsus. The erect pubescence of the fourth and fifth terga is wholly pale. In the female of *C. nigrityla* the thoracic pubescence is largely blackish, white on the scutellum, axillae, at the base of the hind wing, pronotal dorsum and with a few pale hairs on either side of the midline at the anterior margin of the scutum. The scopa is pale externally, sometimes with a few brownish tinged hairs on the basitarsus. The pubescence of the fourth tergum is mostly blackish with a few white hairs basally and white patches laterally; on the fifth segment the pubescence is mostly white but with a strong admixture of blackish, especially in the middle.

The males reflect the similarities of their respective females. That of

C. nigrītula is extensively dark pubescent on the thorax, the scutum entirely blackish or with a narrow band or median patch of whitish pubescence anteriorly. The fourth tergum has a narrow apical band of pale pubescence which is strongly tinged with brownish or fulvous; the fifth tergum is mostly pale pubescent, again strongly tinged with brownish or fulvous, with scattered blackish hairs. The genital structures of the males are very similar, but the eighth and ninth sterna of *C. nigrītula* (figs. 29, 30) are more robust than those of *C. flavifrons* (figs. 31, 32).

The differences between these two species are slight, mostly in degree of melanism. While some differences in the eighth and ninth sterna have been noted, these also are not great and are possibly not significant. Until more material is available from Surinam and Guyana, where the two might be expected to intergrade if they are conspecific, it seems feasible to consider them specifically distinct.

Centris (Centris) adani Cockerell

Figures 33-35

Centris (Cyanocentris) adani Cockerell, 1949. U. S. Natl. Mus., Proc. 98:472-473. ♀.

This species was described from a single female collected at Zamorano, HONDURAS, and has not since been recognized. I have examined the type, now in the United States National Museum of Natural History, and found it at variance with the original description in several important aspects. Because Cockerell's eyesight was not as keen as formerly, I am sure that the faults lie with the description. Significant errors in the original description are as follows: first four terga blue-green, not dark blue; hair of face, occiput and thorax light ochreous, darker on dorsum of thorax, not light reddish; no dark hairs present on venter; middle tibia with fuscous, not gray, hair; scopal hairs yellowish white, not pale reddish; apical margin of fourth and entire fifth and sixth terga light ferruginous, not mentioned in original description; second tergum with medially interrupted apical fascia of pale pubescence; third tergum with complete marginal fascia; fourth tergum with dense, erect pale pubescence; scape with a narrowly interrupted stripe beneath; supra-clypeal mark present. Since this is a common Central American species I am redescribing it, including the previously unrecognized male.

Diagnosis. Female: scopa pale; first four tergites metallic blue-green, each with narrow apical pubescent fascia, evanescent on middle of second; terga V and VI ferruginous; legs dark. Male: pubescence of legs dark, but with apical fringes of mid and hind tibiae and basitarsi ferruginous or paler; first five terga metallic blue-green, second with basal yellow fascia, narrowly interrupted in middle, fifth with apical margin transparent ferruginous; second tergum with lateral apical pubescent fascia, third with fascia broadly evanescent in middle, fourth with complete fascia, obscured by dense erect discal pubescence.

Description. MALE. Measurements. HW 5.45; EL 3.55; UFW 2.10; LFW 2.80; TFD 2.30; SL 0.83; WL 12; TL 16 mm.

Head. Mandible slender, tridentate, inner tooth truncate. Clypeus broad, CW 1.47 x CL, apical margin nearly straight; in profile disc flat, obliquely sloping in basal one-fifth, not raised on either side of midline toward base, without defined raised median line. Face narrow, TFD 0.65 x EL, inner orbits strongly convergent above, UFW 0.75 x LFW; TFD 2.09 x OCD. Scape short, about twice longer than wide, about 0.8 x 1F; 1F:2F:3F:4F = 63:12:20:20. OD:OOD:IOD = 8:7:13. Clypeus moderately shiny, punctures fine, irregularly spaced, with broad median impunctate area.

Thorax. Mesoscutum and scutellum finely punctate, interspaces shiny, punctures separated by less than half a puncture diameter, a little more separated along midline. Mesopleuron finely punctate, punctures elongate, separated by more than a puncture diameter, interspaces dull, densely tessellate. Metapleura shinier, punctures round, coarser than those of mesopleura, separated by half a diameter or less. Propodeal sides more coarsely punctate, punctures variably spaced, separated by half a diameter or more, interspaces moderately shiny. First recurrent vein entering second submarginal cell at basal third. Hind femur about twice longer than wide, angular but not carinate beneath; hind basitarsus simple.

Abdomen. Terga moderately shiny, closely, finely piligerously punctate. Pygidium apically bilobate, with rather sharp median ridge.

Color. Head black, the following pale yellow: mandibles, except dark apices; labrum; malar area; clypeus, except elongate black bar along latero-basal margin; paraocular area to level of antennal socket; transverse supra-clypeal mark; underside of scape. Thorax blackish, tegulae light ferruginous, scutellum and pronotal lobes dull ferruginous. Legs dark rufescent to blackish; all tibiae with basal spot, fore tibia in addition with oblique yellow longitudinal stripe; mid tibia without external stripe. First five terga dark, with metallic blue-green reflections; second segment with broad, transverse basal yellow fascia, narrowly interrupted in middle; fourth and fifth with broad apical transparent ferruginous band; apical segments ferruginous. First four sterna dark basally, with transparent ferruginous margins, apical segments ferruginous. Pubescence mostly pale on head, with a few fuscous hairs on frons and in band across vertex. Thoracic hairs pale, ochreous-tipped on scutum and scutellum, uniformly grayish on pleurae; femora with progressively more fuscous pubescence from fore to hind; fore tibiae with external hairs ferruginous, lighter along hind margin; mid and hind tibiae with mostly fuscous hairs, but posterior fringe conspicuously light ferruginous; mid and hind basitarsi with fuscous hairs externally, except light ferruginous posterior fringe; mid and hind tibiae and basitarsi with fuscous hairs on inner faces. Wings transparent, moderately and uniformly infuscated, veins and stigma blackish.

FEMALE (Type). *Measurements*. HW 5.75; EL 3.55; UFW 2.50; LFW 3.00; TFD 3.00; SL 0.87; WL 12; TL 17 mm.

Head. Mandible slender, quadridentate, two inner teeth approximately equal, inner tooth acute. Labrum about twice wider than long. Clypeus wide, CW 1.56 x CL, similar to that of male, but base and margins less abruptly sloping; with narrow impunctate median line. Face broad, TFD 0.85 x EL; UFW 0.83 x LFW; TFD 2.50 x OCD. Scape 2.5 x longer than wide, SL 0.81 x 1F; 1F:2F:3F:4F = 64:14:18:20. OD:OOD:IOD = 8:10:15.

Thorax. As in male except usual sexual differences.

Abdomen. Similar, except usual sexual differences, to male; pygidial plate narrowly rounded.

Color. Head blackish, mandibles tricolored, yellowish basally, golden apically, narrowly piceous between; labrum cream-colored, margins and apicomedian spot piceous; clypeus with transverse preapical bar and conjoined median stripe which does not attain base; malar area cream-color; para-ocular area cream-color to level of antennal socket; underside of scape cream-color. Thoracic color as in male, but without external stripe on fore tibia. First four terga and extreme base of fifth dark, with metallic blue-green reflections; narrow apical margin of third and broad apical margin of fourth transparent amber; most of fifth and all of sixth terga ferruginous. Sterna mostly ferruginous, with variable infuscations basally and in middle. Pubescence much as in male, but that of fore and mid femora largely pale, of tibiae and tarsi fuscous; scopa yellowish white. Terga II-V with narrow apical fasciae of appressed whitish pubescence, evanescent in middle on II; IV with abundant short, erect plumose discal pubescence which does not wholly conceal surface.

This species ranges from southern Mexico to Costa Rica. I have studied the following material. MEXICO: 1 ♂, Lake Tequesquitengo, 2800', Morelos, 16 Mar 1959 (H. E. Evans; MCZ); 1 ♂, Tezcaltitla, Los Tuxtlas, Veracruz, 2 May 1970 (V. Toledo; LACM); 1 ♀, 5 km E Zapata, Tabasco, 4 May 1970 (V. Toledo; LACM); 1 ♀, 10 mi SE Tehuitzingo, 3900', Puebla, 3 July 1953 (Univ. Kans. Mex. Exped.; LACM); 1 ♀, X-can, Quintana Roo, 28 Apr 1963 (E. C. Welling; LACM). HONDURAS: 1 ♀, Zamorano, 9 Feb 1900 (A. Rivera; USNM, type no. 58878). COSTA RICA: 1 ♂, Palo Verde, Guanacaste, 16 Feb 1972 (C. E. Jones; LACM); 7 ♂♂, 6 ♀♀, 2 km S Liberia. Guanacaste, 1 Mar 1972 (G. W. Frankie; LACM), on *Andira inermis*; 22 ♂♂, 20 ♀♀, 3 km SE Liberia, Guanacaste, 26 Feb 1972 (G. W. Frankie; LACM, TAMU), on *A. inermis*, 1200-1300 hrs; 5 ♂♂, 1 ♀, Hacienda Comelco, 50 m elev, 24 km NW Cañas, Guanacaste, 7 Feb 1972, on *Byrsonoma crassifolia*, 0730-0830 hrs; 2 ♂♂, 1 ♀, same locality, 14 Feb 1972, on *Caesalpinia eriostachys*, 0730-1015 hrs; 4 ♂♂, 3 ♀♀, same locality, 16 Feb 1972, on *C. eriostachys*, 0830-1000 hrs; 23 ♂♂, 6 ♀♀, same locality and date, on *A. inermis*, 1200-1215 hrs; 4 ♂♂, same locality, 22 Feb 1972, "perched on grass near ground, 0930-1000 hrs"; 1 ♂, same locality, 6 Mar

1972, on *A. inermis*, 1045-1120 hrs; 2 ♀♀, same locality, 12 Mar 1972, on *B. crassifolia*, 0700-0800 hrs (all E. R. Heithaus; LACM).

Discussion. Both sexes of this species are superficially similar to such species as *C. poecila* Lepeletier and *C. segregata* Crawford. Few specimens of the Cuban *C. poecila* are available. The one female studied has the erect hairs of the disc of tergum IV simple, and narrow apical fasciae are absent from terga II-IV, the scopa is dark, the mandibles have a small basal spot and the scape is immaculate beneath.

The female of *C. segregata* also has a black scopa and lacks pubescent fasciae on terga II-IV. Like the female of *C. adani*, that of *C. segregata* has erect plumose hairs on the disc of tergum IV; this segment, however, is largely bluish, with a narrow ferruginous margin, rather than mostly ferruginous. The fore tibia of *C. adani* females has a basal macula, but lacks the longitudinal stripe along the external surface present in *C. segregata*.

The male of *C. poecila* lacks maculae on the legs and tergum II, terga I-IV are dark metallic blue (margin of IV reddened), the legs are dark pubescent and the erect hairs of tergum IV are simple. The male of *C. segregata* is more similar to that of *C. adani*, but the basal macula of tergum II is smaller, the fore tibia has a complete external stripe, terga II-IV lack pubescent apical fasciae, on tergum IV plumose hairs are present only along the margin and the hind legs are mostly dark pubescent.

VARIATION IN CEPHALIC CHARACTERS

	<i>TFD</i> × <i>EL</i>	<i>UFW</i> × <i>LFW</i>	<i>TFD</i> × <i> OCD</i>	<i>CW</i> × <i>CL</i>	<i>SL</i> × <i>SW</i>	<i>SL</i> × <i>IF</i>
♀ ♀	0.82-0.87	0.82-0.90	2.00-2.50	1.50-1.59	2.27-2.60	0.78-0.84
♂ ♂	0.64-0.71	0.73-0.80	1.83-2.20	1.40-1.65	2.00-2.30	0.74-0.87

Centris (Centris) segregata Crawford

Figures 36-38

Centris poecila var. *segregatus* Crawford, 1906. Amer. Entomol. Soc., Trans. 32:159. ♀; Friese, 1916. Stett. Entomol. Zeit. 77:296; Lutz and Cockerell, 1920. Amer. Mus. Nat. Hist., Bull. 42:559.

This species was based on four females from San José, Costa Rica. Although described as a form of *C. poecila* Lepeletier, a Cuban species, I believe it must be elevated to species rank. In the female of *C. poecila* the midline of the clypeus is slightly raised, the fourth tergum is narrowly bluish at the base, otherwise ferruginous and the erect pubescence of the fourth tergum is simple and black. In *C. segregata* females the clypeus is slightly depressed along the midline, tergum IV is almost entirely bluish, with a narrow apical ferruginous band and the pubescence of the apical half of that segment is plumose and white in color.

The undescribed male of *C. segregata* is very similar to that of *C. poecila* but has conspicuous basal yellow fasciae on either side of the second tergum

and the fourth tergum is narrowly testaceous along the margin and has a few plumose white hairs. The genital structures are distinctly different. in *C. segregata* the apex of the lobe of the eighth sternum is expanded on either side of the midline (fig. 37); in *C. poecila* the apex is simply rounded (fig. 40). The ninth sternum of *C. segregata* has a much narrower apical process and the hairs are simple (fig. 38) (*C. poecila*, fig. 41). Finally, the ventral process of the gonocoxite of *C. segregata* is digitiform (fig. 36), rather than low and evenly convex as in *C. poecila* (fig. 39).

Specimens of *C. segregata* have been examined from Mexico, Guatemala, Honduras, Costa Rica, Venezuela and Trinidad.

EXALLOCENTRIS, new subgenus

Diagnosis. Female without modified setae on fore and mid tibiae; male without giant branched setae on gonocoxites; scutellum neither bilobed nor tuberculate; maxillary palpus five-segmented; innermost mandibular tooth truncate, upper inner carina terminating near its base.

Description. Mandibles neither subapically broadened nor bent, quadridentate in female, tridentate in male, upper inner carina ending at base of innermost tooth in both sexes, inner tooth truncate in male; maxillary palpus five-segmented, apical segment shorter than basal; ocelli anterior to narrowest part of vertex, lateral ocelli of male about an ocellar diameter from eye margin; first flagellar segment slightly longer than scape, conspicuously shorter than following three combined; mesonotum without defined bare areas; scutellum neither bilobed nor bituberculate; hypoepimeral area not tuberculate; inner face of fore basitarsus of female without row of flattened setae on anterior margin or long, apically spatulate setae on posterior margin; inner face of mid basitarsus of female without row of flattened setae on anterior margin; basitibial plate of female abruptly depressed and concave on apical two-thirds, without defined secondary plate; male with distinct pygidial plate; *male terminalia*: process of eighth sternum about twice longer than broad; apical process of ninth sternum long, narrowly rounded at apex; gonocoxites without apical processes or giant branched setae basally.

Medium-sized species, integument and pubescence dark, male sometimes with preapical maculae on clypeus.

Type species: *Centris (Melanocentris) anomala* Snelling, 1966.

Etymology. Gr., *exalles*, quite different, plus generic name *Centris*.

Discussion. This sugenus includes only the type species, known only from the State of Jalisco, Mexico. The lack of specialized setae on the fore and middle basitarsi of the female will separate this from the similar *Melanocentris* and *Acritocentris*. The male is less distinctive and is similar to those of *Acritocentris*, but has the inner mandibular tooth truncate and the maxillary palpi are five-segmented. The male may be separated from that of

Melanocentris by the termination of the upper inner mandibular carina which ends at the base of the innermost, rather than next to innermost tooth.

ACRITOCENTRIS, new subgenus

Diagnosis. Female: secondary basitibial plate with overhanging margin; abdomen nonmetallic or with metallic reflections; scutellum flat, not bilobed; upper inner mandibular carina ending at base of inner tooth; mandible tridentate, not broadened or bent apically; maxillary palpus four-segmented. Male: gonocoxites without giant branched setae; scutellum flat, not bilobed, hypopimeral area non-tuberculate; mandible tridentate, upper inner carina ending at inner tooth, apex neither broadened nor abruptly bent.

Description. Mandibles no broader subapically than medially, not abruptly bent subapically, tridentate, upper inner carina ending at base of inner tooth, inner tooth triangular; maxillary palpus four-segmented in both sexes, apical segment about as long as basal and weakly subdivided; ocelli before narrowest part of vertex, lateral ocelli of male separated from eye by about an ocellar diameter; first flagellar segment of male longer than scape, shorter than following three segments combined; mesonotum without defined bare areas; scutellum without lateral tubercles or lobes; hypopimeral area non-tuberculate; fore basitarsus of females with elongate spatulate setae; secondary basitibial plate with overhanging margin; first recurrent vein entering second submarginal cell near basal one-third or two-fifth; male with exposed pygidial plate; *male terminalia*: process of eighth sternum about twice longer than broad; apical process of ninth sternum long, narrowly rounded apically; gonocoxites without apical processes or giant branched setae basally. Medium-sized species, black, with mostly black pubescence, males with labrum and clypeus maculate.

Type species: *Centris (Melanocentris) ruthannae* Snelling, 1966.

Included species: *C. agameta*, new species; *C. strawi* Snelling, 1966.

Etymology. Gr., *akritos*, confused or mixed, plus generic name *Centris*.

Discussion. *Acritocentris* is proposed to accommodate three species, two of which I had previously (1966) assigned to the subgenus *Melanocentris* as anomalous species. The three species here assigned to this new subgenus differ in several characteristics from *Melanocentris*: the mandibles are neither subapically broadened nor bent, they are tridentate and the upper inner mandibular carina ends at the base of the inner tooth; the inner tooth is triangular. In *Melanocentris* the mandibles are subapically broadened and bent, quadridentate in the females, tridentate in the males, with the upper inner mandibular carina ending near the base of the third tooth in the females, near the base of the second tooth in the males; the innermost tooth is often truncate or bidentate. The scutellum of *Melanocentris* is tuberculate or raised on either side of the midline in both sexes.

KEY TO SPECIES OF *ACRITOCENTRIS*

- 1. Pubescence of thoracic dorsum pale; female labrum pale pubescent 2
Pubescence of thoracic dorsum black, concolorous with that of head,
sides of thorax and abdomen; female labrum black pubescent
..... *ruthannae* Snelling
- 2. Pubescence on sides of thorax mostly pale, concolorous with that of
dorsum *agameta*, new species
Pubescence of sides of thorax dark, contrasting with that of dorsum
..... *strawi* Snelling

Centris (Acritocentris) agameta, new species

Figures 42-44

Diagnosis. Male: pubescence of thoracic dorsum and most of pleurae pale; paraocular and supraclypeal areas maculate; clypeus coarsely punctate and rugulose. Female: unknown.

Description. MALE (Holotype). *Measurements.* HW 5.15; EL 3.55; UFW 2.00; LFW 2.46; TFD 2.25; SL 2.75; WL 14; TL 17 mm.

Head. Mandible slender, tridentate, inner tooth small, acute. Clypeus broad, CW 1.57 x CL, disc flat in profile, base and sides abruptly sloping; coarsely, closely punctate, interspaces irregularly rugulose, slightly shiny; without median impunctate line or area. Face narrow, inner orbits distinctly convergent above; UFW 0.82 x LFW; TFD 0.63 x EL; TFD 1.61 x OCD. Scape short, about 2.04 x longer than wide, 1.06 x 1F; 1F:2F:3F:4F = 52:16:25:25. OD:OOD:IOD = 8:7:13. Front of vertex at level of ocelli shiny, with very sparse, fine punctures.

Thorax. Mesoscutum dull, punctures coarser than on occiput, contiguous; scutellum a little shinier, punctures much as those of mesoscutum, a little separated medially. Mesopleura slightly shiny, punctures contiguous, finer and shallower than those of mesoscutum. Propodeum slightly shiny, minutely roughened, finely and sparsely punctate. Hind femur about three times longer than wide. First recurrent vein entering second submarginal cell at basal third.

Abdomen. Terga slightly shiny, finely, closely piligerously punctate. Sterna shinier, a little more coarsely, less closely punctate. Pygidium dull, margins distinct, concave. Eighth sternum similar to that of *C. strawi*, with apical process broader preapically than basally (fig. 43); ninth sternum (fig. 44) similar to that of *C. strawi*, but broadest beyond middle and distinctly narrowed in apical fourth.

Color. Black. Labrum, clypeus, triangular paraocular mark and transverse bar on supraclypeal area bright yellow. Tegulae testaceus. Antennae brownish, lighter beneath. Legs dark brownish. Wings transparent, moderately brown, veins and stigma dark brown. Cephalic pubescence light ochreous, fuscous on face between antennal sockets and occiput; a few long, fuscous hairs on sides of clypeus. Thoracic pubescence ochreous, paler on

pleurae; light brown on metapleuron and propodeal side. Pubescence of legs mostly fuscous, paler posteriorly on fore femur and tibia. Anterior face of first tergite with pale ochreous pubescence, abdomen otherwise fuscous pubescent. Eyes with very sparse, short, erect golden hairs.

FEMALE. Unknown.

Type material. Holotype male: Tequila, Jalisco, MEXICO, 18 July 1953 (C. & P. Vaurie, D. Rockefeller Mex. Exp. 1953; AMNH). Paratypes: 1 ♂, Cuautla, Morelos, MEXICO, July-Aug. 1903 (W. L. Tower coll; AMNH); 1 ♂, 10 mi W Colima, Colima, MEXICO, 1 Aug 1954 (M. Cazier, *et al.*; AMNH). Holotype and Cuautla paratype in the AMNH; Colima paratype in LACM.

Etymology. Greek prefix *a-* (without) plus *gamete* (wife or spouse), indicating current lack of females to be assigned to this species.

Distribution. Known only from the above cited localities in central Mexico.

Discussion. Aside from slight difference in measurements and proportions, the two paratypes are very similar to the holotype. *Statistical data:* Cuautla ♂: HW 5.30; EL 3.65; UFW 2.00; LFW 2.35; TFD 2.25; SL 2.80; WL 14; TL 17 mm; CW 1.53 x CL; UFW 0.85 x LFW; TFD 0.62 x EL; TFD 1.61 x OCD; SL 2.07 x SW; SL 1.04 x 1F; 1F:2F:3F:4F = 54:15:-23:22; OD:OOD:IOD = 8:7:13. Colima ♂: HW 5.45; EL 3.80; UFW 2.05; LFW 2.60; TFD 2.35; SL 2.80; WL 14; TL 18 mm; CW 1.58 x CL; UFW 0.79 x LFW; TFD 0.62 x EL; TFD 1.62 x OCD; SL 2.00 x SW; SL 1.02 x 1F; 1F:2F:3F:4F = 55:17:24:25; OD:OOD:IOD = 8:7:14.

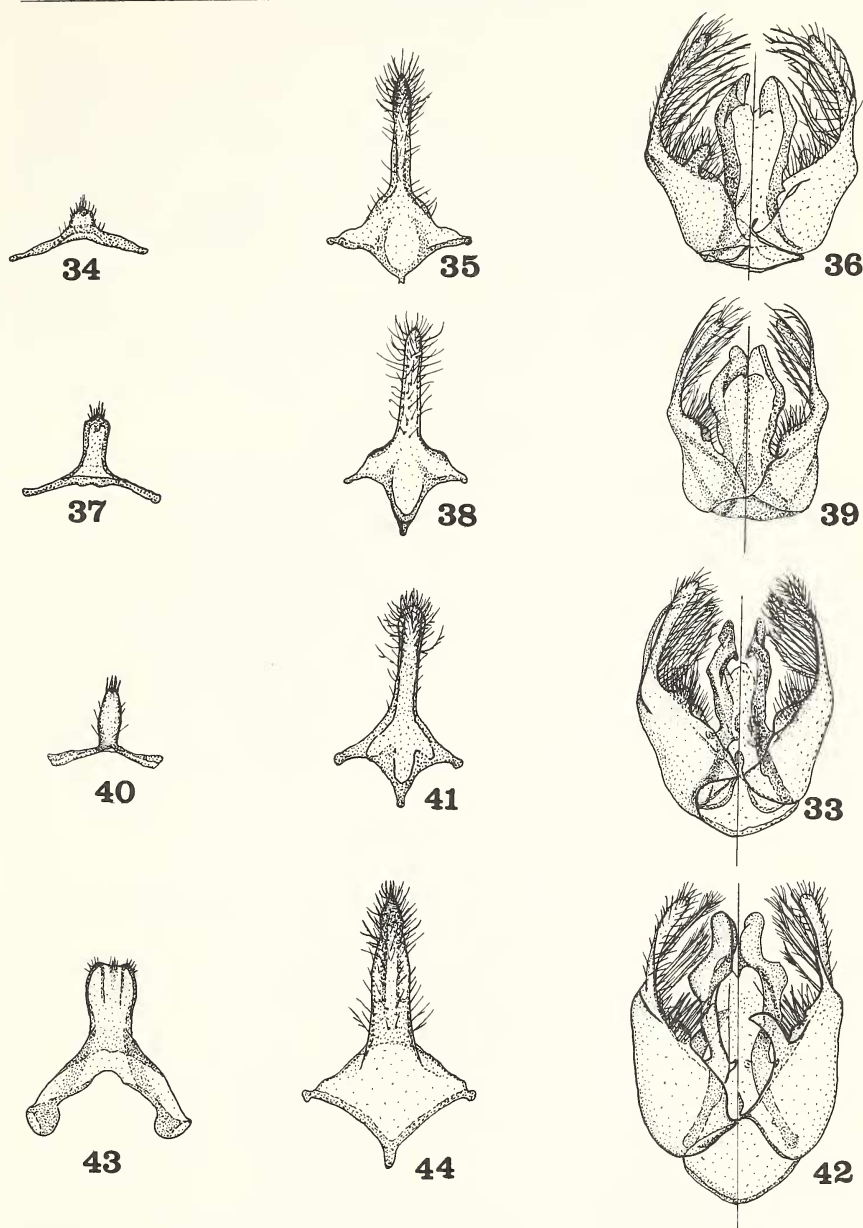
The unknown female of this species probably will be similar to the male except for the usual sexual differences, such as possessing a black clypeus. The distribution of pale pubescence should be as in the male.

Centris (Acritocentris) strawi Snelling

Centris (Melanocentris) strawi Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:27-27. ♂.

Described from a single male from the State of Guanajuato, MEXICO, a number of females certain to belong to this species are now available. Pubescence and color are as in the male, except for the complete lack of maculae. The mandibles are tridentate, the inner tooth triangular, the inner upper carina ending at its base. The clypeus is rugulose in the middle, laterally with coarse, elongate punctures. A prior name for this species may be *C. mexicana albiceps* Friese, 1899, but this cannot be determined until the type is examined.

Distribution. MEXICO. *Nayarit*: 3 ♀♀, Ixtlan del Río, 5 Aug 1963 (P. Fonda-Bonardi; LACM). *Jalisco*: 1 ♀, 20 mi N La Quemada, 27 July 1954 (M. Cazier, *et al.*; AMNH); 1 ♀, 27 mi N Barra de Navidad, 6 Sept 1966 (E. M. Fisher; LACM); 3 ♀♀, 6 mi NE El Rincón, Hwy 80, 3 Aug 1971 (E. M. Fisher; LACM).



FIGURES 33-44. 33-35, *Centris adani*, ♂ : 33, genitalia; 34, sternum VIII; 35, sternum IX. 36-38, *C. segregata*, ♂ : 36, genitalia; 37, sternum VIII; 38, sternum IX. 39-41, *C. poecila*, ♂ : 39, genitalia; 40, sternum VIII; 41, sternum IX. 42-44, *C. agameta*, ♂ : 42, genitalia; 43, sternum VIII; 44, sternum IX.

Centris (Acritocentris) ruthannae Snelling

Centris (Melancentris) ruthannae Snelling, 1966. L. A. Co. Mus., Contrib. Sci. 112:28-30. ♂ ♀.

NEW RECORDS. 7 ♂♂, 11 ♀♀, 1 mi E Douglas, Cochise Co, ARIZONA, 14 Aug 1969 (J. G. & K. C. Rozen; AMNH); 6 ♀♀, same locality, 24 Aug 1967 (J. G. Rozen; AMNH); 2 ♀♀, same locality, 29 Aug 1967 (J. G. Rozen & G. Krueger; AMNH); 7 ♀♀, 3 ♂♂, 30 mi N Nogales, Pima Co, July 1972 (T. J. Zavortink; TJZ), on *Kallstroemia grandiflora*, 0730-0930 hrs.

Previously recorded from Madera Cyn, Santa Rita Mts (type locality), Baboquivari Cyn, Baboquivari Mts and Continental, all ARIZONA.

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